GOVERNMENT-SPONSORED TESTING ON HUMANS

HEARING

BEFORE THE

SUBCOMMITTEE ON ADMINISTRATIVE LAW
AND GOVERNMENTAL RELATIONS

OF THE

COMMITTEE ON THE JUDICIARY
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

FEBRUARY 3, 1994

Serial No. 71

H521-32

Printed for the use of the Committee on the Judiciary

U.S. GOVERNMENT PRINTING OFFICE
84-515 WASHINGTON : 1994

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-046387-4

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GOVERNMENT-SPONSORED TESTING ON HUMANS

THURSDAY, FEBRUARY 3, 1994

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ADMINISTRATIVE LAW
AND GOVERNMENTAL RELATIONS,
COMMITTEE ON THE JUDICIARY,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:20 p.m., in room 2237, Rayburn House Office Building, Hon. John Bryant (chairman of the subcommittee) presiding.

Present: Representatives John Bryant, Barney Frank, David Mann, Melvin L. Watt, George W. Gekas, Jim Ramstad, and Bob Goodlatte.

Also present: Paul Drolet, chief counsel; David Naimon, assistant counsel; Nichole Jenkins, assistant counsel; Cynthia Blackston, chief clerk; and Ray Smietanka, minority counsel.

OPENING STATEMENT OF CHAIRMAN BRYANT

Mr. BRYANT. Good afternoon. The subcommittee will come to order.

The Subcommittee on Administrative Law and Governmental Relations meets today to take testimony concerning government-sponsored tests on humans and possible compensation for people harmed in those tests.

This subcommittee has jurisdiction over compensation for claims against the Federal Government, and considered previous compensation legislation, such as the Civil Liberties Act of 1988, which compensates Japanese-Americans who were in internment camps during World War II, and the Radiation Compensation Exposure Act of 1990, which compensates the residents who lived downwind from the Nevada nuclear testsite and the workers who participated in those tests or who mined uranium for the Government.

This hearing will examine radiation tests and other Government-sponsored experiments performed on humans who did not give informed consent to the experiments, including separate experiments involving the administration of mustard gas and LSD.

All dangerous experiments conducted by the Government on individuals without their knowledge and informed consent are the subject of possible claims against the Government, and at least at this time, there appears to be no significant basis for distinguishing among tests involving radiation, chemical agents, or drugs in terms of real and potential harm to the subjects and the ethics of the Government's conduct.

Let me state explicitly that I think it was wrong for the Government to test the effects of radiation, LSD, mustard gas, or anything else on human guinea pigs without their knowledge and informed consent, and I think it may have been wrong for the Government to conduct these experiments not only under the ethical standards that now apply, but also under the post-World War II standards in existence at the time of the experiments. Some of our witnesses today also may be able to speak to that question.

Our task is to examine these tests, whether the subjects gave informed consent to participating in such tests, what harm resulted from the tests and what possible compensation options we could choose if we decide that compensation is appropriate.

We expect to be involved in the human testing issue for some time to come. Today's hearing is just a first step and does not focus on any particular legislation. We expect to have more hearings before we consider whether to legislate in this area, and we will be working closely with the administration in fashioning an appropriate response.

I would like to commend the Clinton administration, and in particular Secretary Hazel O'Leary, for the forthright response to this problem, for revealing what we sometimes don't like to know about our own recent history, and for making clear to the American people what has gone before and exactly the extent to which damage may have been done that may result, and all of us, assuming collective responsibility for what was done in the name of our own Government. We appreciate the presence today of representatives of six different Federal agencies involved in the Human Radiation Interagency Working Group and look forward to hearing your testimony and conversing with them about these issues.

We realize that with so many witnesses there will be limited time for answering questions today and we expect to be submitting additional written questions to the agencies after the hearing. We appreciate their continued cooperation in getting these questions answered.

That concludes my statement.

At this time I would recognize the gentleman from Pennsylvania, the ranking Republican member of the subcommittee, Mr. Gekas.

Mr. GEKAS. I thank the Chair. Yes, this is no joke. We are going to be inquiring into a very serious subject matter, and as the chairman has so very carefully outlined, it will be an issue which will remain with us for quite some time to come.

Luckily for the public—I say that advisedly—luckily for the general public and the interests of the American people, this committee has for several terms now had the jurisdiction over individual cases which citizens have brought before us for special consideration under the system of special bills that we entertain in the Congress of the United States. So that we have learned, the members of this committee, and our record of proceedings over the last few terms is replete with them, of instances where no consent was given and where experimentation took place at a random and sometimes deadly pace in various stages of our development of the armed forces and the relationship of those people who served there and the experiments that were being conducted.

I myself remember, and I am wondering now whether I was a victim of such experimentation. When I was in basic training at Fort Knox, as part of the training—all of us dog faces will remember this—we had a tear gas episode in which to test the response for our masks, our gas masks. We were placed in a little hut of some sort and then the gas was to be admitted and then a signal was to be given as to when you should put the tear gas mask on. So that the first effects of the gas would hit you, but you would quickly respond to cut off any further effects.

I remember specifically, and I don't know the purpose of it yet, that some of us were told that we would respond when the signal was given, and others at a little later point and the third group at even a later point. I am wondering, and I was on the last one, whether I was a guinea pig to see whether that extra blast of gas would affect me.

Now I look over my legislative career, I wonder if it did affect me or not. But it is not a joke. That is what I said in the beginning. It is not a joke, yet I can see the way these themes of experimentation might have grown up in the Armed Forces.

I join with the chairman in inviting continuous contact with all of those who are interested, with the administration, with our colleagues who will have specifics to present to us, and with any followup that might be appropriate we will receive it in due course.

I thank the Chair.

Mr. BRYANT. Do other members seek recognition for opening statements?

The gentleman from Ohio.

Mr. MANN. I would like to thank you for convening this hearing today and those witnesses who will be participating. I have a direct interest in terms of my district since it has become revealed in recent weeks that at the University of Cincinnati Medical Center in the 1960's, into the early 1970's, various whole body and part body radiation treatments were applied to patients, and since that story first surfaced during our break, I spent some time working with the university officials to begin to piece together what happened and what issues there may be.

Some 80 individuals were exposed to doses of radiation in Cincinnati. Most of those individuals volunteered. None were told, however, that the radiation was being supplied pursuant to funding from the Department of Defense, and it is unclear how much they were told about the potentially serious side effects that the radiation might be applied.

The Cincinnati Post quotes from a Pentagon document that: "In the University of Cincinnati tests, the distinction between saving lives and damaging lives may have been blurred." This is obviously very troubling.

I know that our job here today is to discuss the issue of compensation, but I think we must also stress the importance of full disclosure of all material held either by private institutions that may have had funding from the Federal Government, as well as documents of the Federal Government. The victims of radiation experiments, whether in Cincinnati or in other parts of the country, deserve a complete explanation of the purpose of the test in which they participated.

While some participants may have agreed to the tests in Cincinnati in the name of patriotic duty, others agreed to participate in the hope that some radical measures might lengthen their lives. Whatever reason, the Government bears the responsibility of the experiments it funded and must make a full accounting to the people of this country.

I want to commend the efforts of Congressman Markey, who has tirelessly investigated this issue I know for some time, and I appreciate his willingness to participate with us today. I am encouraged by the attitude being presented by President Clinton, Secretary O'Leary and others in the administration.

I think it is useful that the Human Radiation Interagency Working Group has been organized and I hope that that group can work quickly to make sure that information is shared with the public so that we can make decisions about the compensation. As a former U.S. Naval officer, I can appreciate the desire of the Pentagon to have an accurate assessment of the effects of potential military weapons on our troops. But the Government should not test its wares on private American citizens without their complete and educated consent.

It seems to me that there are two issues of Federal compensation. If anyone who was exposed to whole body radiation at the University of Cincinnati was not fully informed of the nature of that radiation, then it seems to me that compensation is appropriate for that individual or his or her family.

Similarly, if the project at the University of Cincinnati or any place else departed from prevailing medical norms for experimental programs, because of the defense considerations or funding sources or the like, it seems to me that compensation is appropriate.

I look forward to working with you, Mr. Chairman, and members of the committee, on the compensation issues. Thank you.

[The prepared statement of Mr. Mann follows:]

The Statement of

The Honorable David Mann

February 2, 1994

"Government Sponsored Human Radiation Tests"

Mr. Chairman, I would like to thank you for convening this hearing today and I would like to thank the witnesses who will testify for their willingness to be here and for the insight they will share.

As you know, Mr. Chairman, I have a very direct interest in the radiation tests that were conducted and funded by the government during the Cold War - particularly those tests conducted at Cincinnati General Hospital between 1960 and 1971.

Since this story first surfaced during the Congressional recess I have been working with the help of University of Cincinnati officials to piece together all of the available information on the nature of the Cincinnati experiments.

So far I have learned that as many as 80 individuals were exposed to doses of partial or whole body radiation. I have also learned that while most or all of the test victims volunteered and consented to the radiation treatments - none were told that the experiments were being funded in part by the Department of Defense. It remains unclear how much they were told about the potential, serious side effects.

Yesterday's Cincinnati Post quotes from a Pentagon document that "In the University of Cincinnati tests... the distinction between saving lives and damaging them may have been blurred." This is very troubling to me.

I know that our job here today - and as members of the Judiciary Committee - is to discuss compensation to victims and their families. But I think we must also stress the importance of full disclosure of all material held by private institutions and by the federal government. The victims of the radiation experiments - whether in Cincinnati or in other parts of this country - deserve a complete explanation of the purpose and nature of the tests in which they participated. Many participants agreed to the tests in the name of "patriotic duty". Others agreed to participate with the hope that these radical methods could in some way extend their lives. Whatever the reason, the government bears the full responsibility for the experiments it funded and must now make a full accounting.

I would like to commend the efforts of Representative Ed Markey who has tirelessly investigated the issue of radiation experiments on behalf of the test victims from his district in Massachusetts. I appreciate his willingness to present to this Subcommittee his recommendations for compensating victims.

I would also like to add that I am encouraged by the attention paid to this issue by President Clinton and his Administration. I commend the establishment of the Human Radiation Interagency Working Group. I hope that this rapid response will enable the relevant agencies to collect all of the radiation documents and that full public disclosure will not be delayed.

Mr. Chairman, as a former United States Naval Officer I can appreciate the desire of the Pentagon to have an accurate assessment of the effects of potential military weapons on our troops. I do not, however, believe that the government should test its wares on private American citizens or military personnel without their complete and educated consent.

As we look into the radiation experiments I will hold the view that federal compensation should be made to the victims when they were not fully informed under the then prevailing standards or when the radiation procedures differed significantly from appropriate medical care devoted only to the interest of the patient and bone fide medical science. I look forward to working with you to craft a compensation bill that will be fair and just. Thank you Mr. Chairman.

Mr. BRYANT. Thank you. The gentleman from Minnesota.

Mr. RAMSTAD. Mr. Chairman, very briefly, because it is certainly more important that we hear from our witnesses, but I, too, commend you for holding this important hearing. I just want to make a couple of points.

First of all. three of our witnesses here today, Mr. Gamble, Mr. Frosini, and Mr. Schnurman were victimized by the very government whom they proudly served. You three gentlemen and others are true patriots and I deeply regret what you gentlemen experienced.

At times like this, when we unlock the secrecy and expose the truth, no matter how embarrassing or shocking the truth may be, I believe that we strengthen our Nation and our democratic system of government. So I encourage all concerned parties from the various departments and agencies represented here today, as well as those not here today who have an interest in this matter, to leave no stone unturned in their investigations, because we need to know the truth.

And then we need to redress any wrongs and take steps to make sure that such wrongs are never again repeated by this Government.

Thank you again, Mr. Chairman, and I also applaud the efforts of Mr. Markey, Mr. Frost, Mr. Goss, and the other members who have led the charge on this very, very important, gut-wrenching issue.

Thank you, Mr. Chairman.

Mr. BRYANT. Thank you. The gentleman from North Carolina.

Mr. WATT. Mr. Chairman, in the interest of time, I will not give an opening statement.

Mr. BRYANT. Thank you.

We would welcome to the witness table then the first panel of witnesses which consists of four Members of the House of Representatives with specific expertise and/or local interest in this topic. Congresspersons Markey, Frost, Goss, and Byrne. And I would introduce them one at a time.

First, the gentleman that told the Nation about this some 8 years ago as chairman of the Energy Subcommittee of the Energy and Commerce Committee. I think was greeted, as I understand it, I am sure, more with denials, and if there is any American that has any right to say "I told you so" at this stage of the inquiry, it would certainly be the Honorable Ed Markey of Massachusetts.

We welcome you and invite you to testify.

STATEMENT OF HON. EDWARD MARKEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Mr. MARKEY. Thank you, Chairman Bryant, very much and you, Mr. Gekas, and the other members of the subcommittee. Thank you for the opportunity of being able to testify here today.

I commend you and I commend the other members of the subcommittee for convening hearings on this important subject. I will summarize my statement and ask that my full statement be included in the record, and that our 1986 report be put in the record in its entirety.

Mr. **BRYANT**. Without objection, all of the statements submitted by these Members will be included as part of the record.

Mr. **MARKEY**. As you know, Mr. Chairman, better than almost anyone else in the country, our Subcommittee on Energy that you and I served on in 1986 did, in fact, release a report that 31 experiments had been conducted and that 695 people had been experimented upon, and we did that, our subcommittee that you served on back in 1986. Unfortunately, it fell on deaf ears. At that point in time, neither the Department of Energy nor the country in many ways was ready to hear the horror of the past which was revealed in that study at that time. In many ways, it was like casting seeds upon pavement. There was no likelihood that it would go anywhere during that period of time.

But the recent acknowledgment by Federal officials that the Government conducted radiation experiments with human guinea pigs has grabbed the attention of U.S. citizens because most people assume that our country would not engage in that kind of activity. To close the door on that regrettable legacy, we should focus on proper remedies to respond to past wrongs, ensure these things can never happen again, and do the right thing today for those who were injured.

Accordingly, I plan to introduce legislation soon which will address the issue of compensation. My experience with these issues stems from the report which I and the other members of our subcommittee issued in October 1986: "American Nuclear Guinea Pigs: Three Decades of Radiation Experiments on United States Citizens." This report revealed the frequent and systematic use of human subjects as guinea pigs in experiments with ionizing radiation which provided little or no medical benefit to those who were experimented upon. These experiments can only be characterized as repugnant or bizarre and were marred by a lack of informed consent in many instances.

This report was essentially ignored by the Reagan administration, and it languished on a shelf at the Department of Energy. When Secretary Hazel O'Leary learned of these experiments and the 1986 staff report, she decided to disclose all information on human experimentation. I commend and support her efforts to lift the shroud of secrecy that has covered her agency for a generation.

It is not my desire, however, to blame present leaders or past institutions for past mistakes. My concern is that institutions work with Congress today to address past abuses.

I, therefore, welcome the leadership by the Clinton administration and by this subcommittee, and I look forward to working with the administration and this subcommittee and the scientific community in formulating proper responses today. Clearly, this subcommittee has much experience in crafting compensation plans. Let me share with you my thoughts on the proper response to the experiments disclosed in the 1986 report.

First, require full disclosure from the Department of Energy while protecting the privacy of subjects and their families on DOE-funded experiments with ionizing radiation that provided little or no benefit to the subjects.

Second, require DOE to formulate a plan to conduct proper medical followup of subjects where it seems feasible, and to provide free medical care for injustices related to experiments.

Third, require the Secretary of Energy, after consultation with other appropriate Federal health and Justice Department officials, to recommend appropriate compensation for those subjects or their families who have suffered injuries.

The legislation I propose does not impose a particular compensation plan, but rather directs the Secretary of Energy to report to Congress in 6 months on what should be the appropriate scheme.

Now I recognize that there is some debate on the effectiveness, for example, of the Downwinder legislation and the Radiation Exposed Veterans Compensation Act of 1988, two subjects that this subcommittee knows well. In light of that debate, the administration and this subcommittee should review these and other compensation systems and then develop an appropriate system for the victims that are identified today. The best system would merge science with compassion in determining standards for compensation. Provisions should also be made for appropriate remedies other than monetary compensation to unwitting subjects who suffered "dignity injury."

The legislation that I will introduce will focus on the DOE and its information because of my previous involvement with that department. However, I note that other witnesses today will discuss experiments conducted by the Government using chemical or biological agents. I think it is important for this subcommittee to explore these other areas where Americans may have been used as experimental subjects and exposed to danger.

Mr. Chairman and members of this subcommittee, what this Congress has encountered is no less than the frequent and systematic use of U.S. citizens as guinea pigs during experiments with a variety of dangerous radiation, chemical, and biological agents. These experiments shock the conscience and demand a response.

I look forward to working with you and our colleagues to gain full disclosure of this shameful past, to provide the medical followup and treatment that experimental subjects deserve, and to provide restitution to those citizens who have suffered injury.

And to those who have been harmed, we owe compensation. And the witnesses who will testify today, the victims, put finally the human face on what happened. It occurs to me retrospectively that our report in 1986 was missing the human beings, the actual people. Today before your subcommittee they appear, and I think that human face guarantees that they will be given the full compensation that they deserve for the harm which was done to them and their families in the name of national security in protecting this country against communism.

I thank you, Mr. Chairman.

[The prepared statement of Mr. Markey follows:]

EDWARD J MARKEY
7TH DISTRICT MASSACHUSETTS

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STATEMENT OF REPRESENTATIVE EDWARD J. MARKEY
BEFORE THE HOUSE JUDICIARY COMMITTEE
SUBCOMMITTEE ON ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS
February 2, 1994

Chairman Bryant and members of the Subcommittee, thank you for the opportunity to appear before you today. I wish to commend the Chairman and the Subcommittee for convening these hearings as the Congress begins to consider the remedies necessary to correct past wrongs which the U.S. government has committed against its own citizens.

The recent acknowledgement by federal officials that the government conducted radiation experiments with human guinea pigs has grabbed the attention of all U.S. citizens, and the reason is that most people assumed that our country would not engage in this kind of activity. I think the fact that the federal government -- our government -- funded or engaged in this kind of activity is the most disturbing aspect of this whole story. Most Americans thought that our country would not take that kind of action. To close the door on this regrettable legacy, we should focus on the proper remedies to respond to past wrongs, make certain these things can never happen again, and do the right thing today by compensating those who suffered injury.

With the Subcommittee's indulgence, I would like to briefly describe my involvement with these issues. In October 1986, I released "American Nuclear Guinea Pigs: Three Decades of Radiation Experiments on U.S. Citizens," a staff report of the House Subcommittee on Energy Conservation and Power. This report revealed the frequent and systematic use of human subjects as guinea pigs in experiments with ionizing radiation which provided little or no medical benefit to the subjects. With the permission of the Chairman and this Subcommittee, I wish to provide a copy of the 1986 report for the record.

The 1986 report also discussed some of the more repugnant or bizarre experiments. At the top of this list were the plutonium injection experiments, in which patients designated terminal within 10 years were given plutonium to determine how the body handled this radioactive material. This experiment provided no medical benefits to the subjects, and is marred by a lack of informed consent, since even the word "plutonium" was classified during the 1940s. Moreover, as my staff report documents, when the Atomic Energy Commission conducted a follow-up study in 1973 to determine the amounts of plutonium remaining in subjects' bodies, informed consent was not obtained from patients who were still alive, nor from families who were asked for permission to exhume the bodies of deceased subjects. Sadly, thirty years later, the word "plutonium" was still too explosive for the federal government to tell the victims.

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In another set of experiments which have only recently come to light, at the Fernald School in Massachusetts during the 1940s and 50s, schoolboys classified as mentally retarded were fed radioactive calcium and iron with their breakfast meals. Yet parents of these children were deceived about the nature of the experiments when they gave their consent. With at least one experiment, the letter from the School requesting consent never mentioned that radioactive material would be fed, noted that experimental subjects were selected from a "group of our brighter patients," and implied that the experiment might result in "gains in weight and other improvements."

These experiments were funded by the Atomic Energy Commission, the National Institutes of Health, and the Quaker Oats Company, and research was conducted by faculty at MIT and Harvard. These experiments clearly fit within the scope of the documents that I requested from the Department of Energy in the mid-1980s, yet they were not revealed then. One question that I have today is whether we know the full scope of human exprimentation; whether the 1986 staff report provides a reasonably accurate picture or whether the extent of testing is larger.

One reason why I find these experiments so repugnant is because of the vulnerable nature of the subjects used. It was no accident that the students at the Fernald School were fed radioactive iron, and not the students at MIT. It is no accident that the terminally ill were experimental subjects, including some who were comatose. It is no accident that prisoners, soldiers, and the elderly were used for testing with radioactive material. Such members of society are not fully enfranchised and lack control over their lives. They deserve protection, not exploitation as human guinea pigs. Certainly, experimental drugs or treatments intended to make the patient better may be used. But that was not the case with these experiments. We must again look at our ethical guidelines to make certain they protect the vulnerable.

The response of the Reagan administration to my 1986 staff report can be described as, "Thanks for the information, we're not going to do anything," and the report languished on a shelf at the Department of Energy until recently. Then in November 1993, a series of articles by Eileen Welsome, a reporter at the Albuquerque Tribune, identified some victims of the plutonium injection experiments and their families, and put a human face on the issue. When Secretary of Energy Hazel O'Leary learned of these experiments and my 1986 staff report, she decided that the appropriate course of action was full disclosure of all information on experiments with human subjects. I commend Secretary O'Leary and support her efforts to lift the shroud of secrecy on her Department, and bring the questionable past of the Department and its predecessor agencies into the sunshine of public scrutiny.

When I released my staff report in 1986, I had assumed that experiments of such nature were the product of the arrogance of the early Atomic Age, and the paranoia of the Cold War. But as these experiments have gained new attention, I have been shocked and dismayed to find that individual scientists feel compelled even today to defend these experiments of years ago. Some have stepped forward to claim that such experiments should not be judged according to today's standards, and besides, the doses given were low. To these attitudes, I have two responses: First, contrary to such opinions, the 1940s and 1950s were not devoid of patient knowledge or ethical standards. Radiation and its health effects were widely discussed in the era of bomb shelters and air raid drills. Moreover, the Nuremberg Code was in effect, written by the United States and the Allies in the aftermath of World War II, and it established guidelines on obtaining informed consent for experiments. Clearly, the Fernald School experiments violate this basic human rights standard.

In this regard, I commend the recent statement of Charles Vest, president of MIT, who acknowledged that while doses at the Fernald School may have been relatively low, he was "sorry" for the experiments, because of the children selected and the lack of informed consent. MIT explained that President Vest issued his statement because "it seemed the decent thing to do," and I applaud his decency.

It is not my desire to blame present leaders of organizations and institutions for past mistakes. My concern is that institutions work with Congress today to do the right thing to address past abuses. I therefore welcome the leadership by the Clinton Administration, and I look forward to working with the Administration, this Subcommittee, and the scientific community in formulating proper responses today. Clearly, this Subcommittee has much experience in crafting compensation plans.

I have already circulated to our colleagues a letter inviting them to co-sponsor legislation with me that would accomplish three goals:

- Require full disclosure from the Department of Energy, while protecting the privacy of subjects and their families, on experiments with ionizing radiation that provided little or no benefit to the subjects and were funded by the Department or its predecessor agencies;

- Require the Department of Energy to formulate a plan to conduct proper medical follow-up of subjects where it seems feasible and indicated; and to provide free medical care for injuries related to experiments;

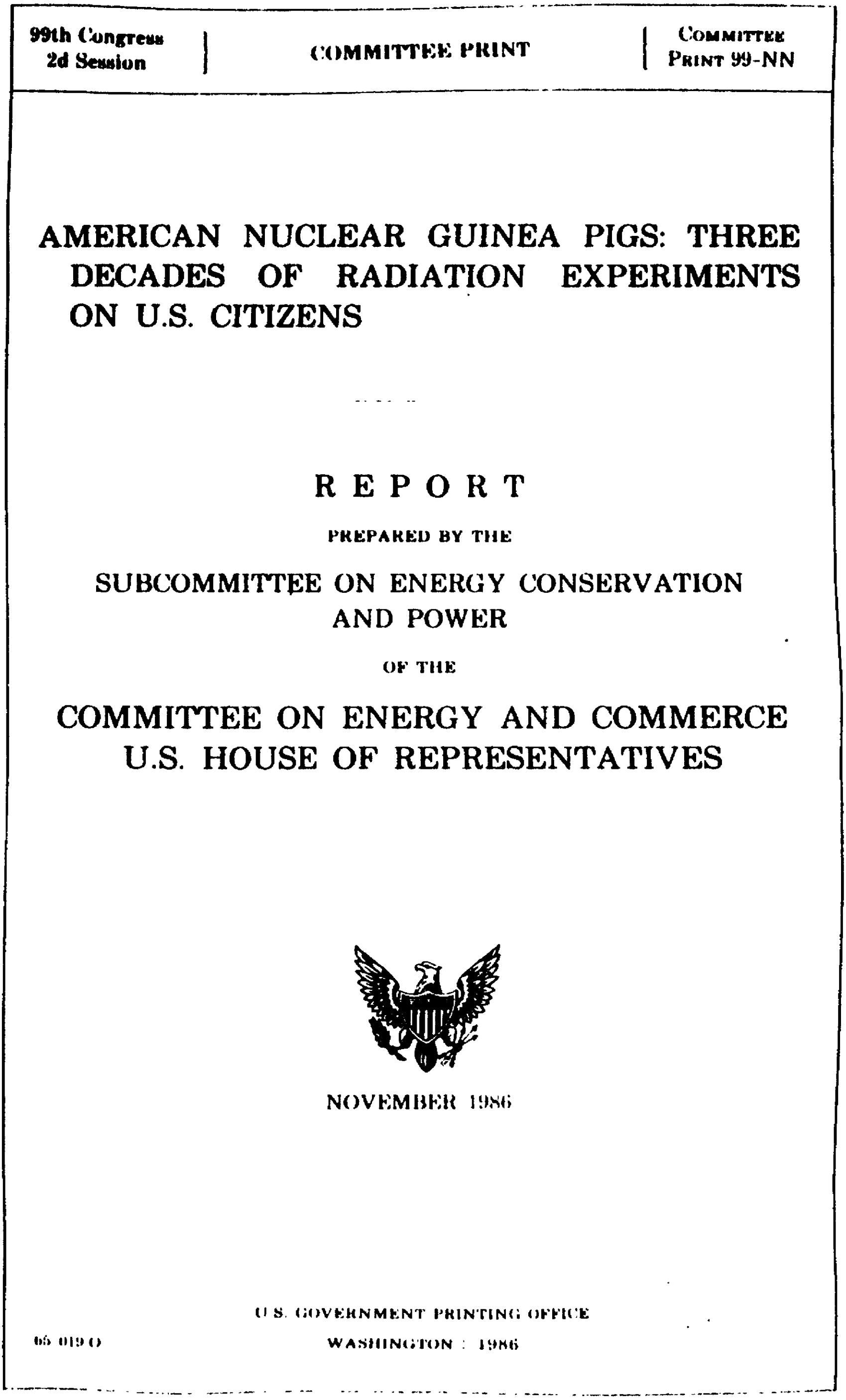
- Require the Secretary of Energy, after consultation with other appropriate federal officials, to recommend appropriate compensation for those subjects or their families who have suffered damages, and make any other recommendation for appropriate compensation for those who have been wronged.

The legislation I will propose does not impose a particular compensation plan, but rather directs the Secretary of Energy to report to Congress in six months on what should be the appropriate scheme. I recognize that there is some debate on the effectiveness of the Downwinder legislation and the Radiation Exposed Veterans Compensation Act of 1988 -- two subjects that this Subcommittee knows well. In light of that debate, I think it is appropriate for the Administration to review these and other compensation systems and then develop an appropriate system for the victims identified here today. The best system would merge science with compassion in determining standards for compassion. Provision should also be made for appropriate remedies other than monetary compensation to unwitting subjects who suffered "dignity injury."

The legislation that I will introduce will focus on the Department of Energy and the information it possesses because of my previous involvement with that Department. However, I note that other witnesses before this Subcommittee will discuss experiments conducted by the federal government using chemical or biological agents. Unfortunately, the sad history of the government's use of its own citizens as guinea pigs is not limited to ionizing radiation. I think it is important for this Subcommittee to explore other areas where Americans may have been used as experimental subjects and exposed to danger.

For example, a recent report from a scientific panel convened by the Institute of Medicine, Veterans at Risk, investigated the long-secret exposure of soldiers as experimental subjects to chemical warfare agents. This report noted that over 60,000 military personnel were used as subjects, including 4,000 soldiers exposed to mustard gas and Lewisite, a related chemical. The panel concluded that although experimental subjects were designated "volunteers," it was clear from official reports that recruitment of subjects "was accomplished through lies and half-truths," during World War II and later experiments as well. The panel found it "most appalling" that no long term medical follow-up was conducted on the subjects, despite knowledge available by 1933 that mustard gas and Lewisite could produce long term detrimental health effects.

Mr. Chairman and members of this Subcommittee, what this Congress has encountered is no less than the frequent and systematic use of U.S. citizens as guinea pigs during experiments with a variety of dangerous radiation, chemical, and biological agents. These experiments shock the conscience and demand a response. I look forward to working with you and our colleagues to gain full disclosure of this shameful past, to provide the medical follow-up and treatment that experimental subjects deserve, and to provide restitution those citizens who have suffered injury.



99th Congress
2d Session

COMMITTEE PRINT

COMMITTEE
PRINT 99-NN

AMERICAN NUCLEAR GUINEA PIGS: THREE DECADES OF RADIATION EXPERIMENTS ON U.S. CITIZENS

REPORT

PREPARED BY THE

SUBCOMMITTEE ON ENERGY CONSERVATION
AND POWER

OF THE

COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

NOVEMBER 1986

U.S. GOVERNMENT PRINTING OFFICE
65 019 O
WASHINGTON : 1986

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

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LETTER OF TRANSMITTAL

U.S. House of Representatives,
Subcommittee on Energy Conservation and Power,
Committee on Energy and Commerce,
Washington, DC, October 24, 1986.

Hon. John D. Dingell,
Chairman, Committee on Energy and Commerce, Rayburn House Office Building, Washington, DC.

Dear Mr. Chairman: I am forwarding to you, for the Committee's use, a report prepared by the staff of the Energy Conservation and Power Subcommittee titled, "American Nuclear Guinea Pigs: Three Decades of Radiation Experiments on U.S. Citizens." This report describes material contained in Department of Energy documents on radiation experiments using human subjects.

A review of these documents reveals the frequent and systematic use of human subjects as guinea pigs for radiation experiments. Some of these experiments were conducted in the 1940's and 1950's, and others were performed during the supposedly more enlightened 1960's and 1970's. The report describes in detail 31 experiments during which about 695 persons were exposed to radiation which provided little or no medical benefit to the subjects. The report notes that it seems appropriate to urge the Department of Energy to make every practicable effort to identify the persons who served as experimental subjects, to examine the long-term histories of subjects for an increased incidence of radiation-associated diseases, and to compensate these unfortunate victims for damages.

This report is the result of an ongoing Subcommittee examination of the health and safety policies of the Department of Energy. The previous Subcommittee Chairman, Mr. Ottinger, requested from the Department documentation on experiments involving human test subjects and radiation, which were funded by DOE or its predecessor agencies. During the 99th Congress, the Subcommittee initiated an intensive review of the documents, and requested further information on specified experiments. This report is the result of that intensive review.

It should be noted that this report was prepared by the Subcommittee staff for discussion purposes and may not represent the views of all Committee members. I believe the Committee and others will find this report to be extremely useful in examining issues of radiation health and safety and victims' compensation.

Sincerely,

Edward J. Markey, *Chairman.*

AMERICAN NUCLEAR GUINEA PIGS: THREE DECADES OF RADIATION EXPERIMENTS ON U.S. CITIZENS

SUMMARY AND CONCLUSIONS

Documents provided by the Department of Energy reveal the frequent and systematic use of human subjects as guinea pigs for radiation experiments. Some experiments were conducted in the 1940s at the dawn of the nuclear age, and might be attributed to an ignorance of the long term effects of radiation exposure, or to the atomic *hubris* that accompanied the making of the first nuclear bombs. But other experiments were conducted during the supposedly more enlightened 1960s and 1970s. In either event, such experiments cannot be excused.

These experiments were conducted under the sponsorship of the Manhattan Project, the Atomic Energy Commission, or the Energy Research and Development Administration, all predecessor agencies of the Department of Energy. These experiments spanned roughly thirty years. This report presents the findings of the Subcommittee staff on this project.[1]

Literally hundreds of individuals were exposed to radiation in experiments which provided little or no medical benefit to the subjects. The chief objectives of these experiments were to directly measure the biological effects of radioactive material; to measure doses from injected, ingested, or inhaled radioactive substances; or to measure the time it took radioactive substances to pass through the human body. American citizens thus became nuclear calibration devices.

In many cases, subjects willingly participated in experiments, but they became willing guinea pigs nonetheless. In some cases, the human subjects were captive audiences or populations that experimenters might frighteningly have considered "expendable": the elderly, prisoners, hospital patients suffering from terminal diseases or who might not have retained their full faculties for informed consent. For some human subjects, informed consent was not obtained or there is no evidence that informed consent was granted. For a number of these same subjects, the government covered up the nature of the experiments and deceived the families of deceased victims as to what had transpired. In many experiments, subjects received doses that approached or even exceeded presently recognized limits for *occupational* radiation exposure. Doses were as great as 98 times the body burden recognized at the time the experiments were conducted.

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[1] This report does not necessarily reflect the views of the Members of the Committee.

A later section of this report, Description of Human Radiation Experiments, provides details on 31 experiments, during which about 695 persons were exposed. Experiments are listed by Category and Number as designated by the Department of Energy. Some of the more repugnant or bizarre of these experiments are summarized below.

During 1945 to 1947, as part of the Manhattan Project, 18 patients who were diagnosed as having diseases which gave them expected survivals of less than 10 years were injected with plutonium, to measure the quantity retained by the human body. These experiments were carried out at the Manhattan District Hospital at Oak Ridge, Tennessee; Strong Memorial Hospital in Rochester, New York; the University of Chicago; and the University of California, San Francisco. Despite the original diagnoses, seven of these patients lived longer than 10 years, and five lived longer than 20 years. Internal investigations by the Atomic Energy Commission found that informed consent was not granted in the initial experiments, since even the word "plutonium" was classified during World War II; and living patients were not informed that they had been injected with plutonium until 1974. (Category 1.001, Number 1).

From 1961 to 1965 at the Massachusetts Institute of Technology, 20 subjects, aged 63 to 83, were injected or fed radium or thorium to estimate internal doses and to measure passage of these substances through their bodies. Many of these subjects came from the nearby Age Center of New England, a research facility established to investigate the process of aging and the needs of the elderly. These experiments thus represent a perversion of the Center's original purpose, since feeding the subjects radium and thorium did not benefit them as individuals or the elderly population as a whole. (Category 1.002, Number 118).

During the 1960s, at the Los Alamos Scientific Laboratory, 57 normal adults were fed microscopic spheres containing radioactive uranium and manganese. These experiments were designed to determine how fast such spheres would pass through the human body after ingestion. It was believed that particles of this size could be produced by the atmospheric reentry and burnup of rockets propelled by nuclear reactors, or of radioactive power supplies. (Category 1.003, Number 106).

During 1946 and 1947, at the University of Rochester, six patients with good kidney function were injected with uranium salts to determine the concentration which would produce renal injury. One patient was diagnosed as being in a "hallucinatory state," another was considered suffering from "emotional maladjustment," and a third, admitted to the hospital for a fifth time, was described as follows: "As he had no home, he agreed willingly to enter the metabolic unit for special studies." (Category 1.003, Number 119).

From 1963 to 1971, 67 inmates at Oregon State Prison and 64 inmates at the Washington State Prison received x-rays to their testes to examine the effects of ionizing radiation on human fertility and testicular function. These experiments were conducted by the Pacific Northwest Research Foundation and the University of Washington. Subjects had to agree to receive vasectomies after completion of the experiments. The Energy Research and Development Administration planned to begin medical follow up of the irradiated prisoners, but these plans were dropped in 1976 at the request of the U.S. Attorney in Portland after several irradiated inmates filed suits against state and federal governments. (Category 2.001, Number 2 and Category 2.002, Number 189).

From 1953 to 1957, at Massachusetts General Hospital, Boston, approximately 12 terminal brain tumor patients were injected with uranium to determine the dose at which kidney damage began to occur. Most of the patients were described as comatose or in a "semi-coma." (Category 9.001, Number 166).

From 1963 to 1965, at the Atomic Energy Commission National Reactor Testing Station in Idaho, radioactive iodine was purposely released on seven separate occasions. In one of these experiments, seven human subjects drank milk from cows which had grazed on iodine-contaminated land. This experiment was designed to measure the passage of iodine through the food chain into the thyroids of the human subjects. In a second experiment, three human subjects were placed on the pasture during iodine release, and seven subjects were placed on the pasture in a third experiment. In addition, "several" individuals were contaminated during yet another experiment when vials of radioactive iodine accidentally broke. Cows grazed on contaminated land and their milk was counted in four of the experiments; in the remaining three, radiation measurements were made only on the pasture. (Category 10.001, Number 173).

During May 1945, at the Clinton Laboratory, Oak Ridge, Tennessee, two groups of 10 subjects were exposed to beta rays, to determine the dose that would begin to cause reddening of the skin. (Category 11.001, Number 51).

During 1951 and 1952, at least 14 human subjects were exposed to tritium in air, by immersion of body parts in water, or by drinking. These experiments were designed to measure the retention or excretion of tritium by the human body. The experiments were carried out by the Los Alamos Scientific Laboratory, or the General Electric Company in Richland, Washington. (Category 11.001, Numbers 112, 123, 125, 126, 127).

During 1956, the U.S. Air Force sent manned planes through radiation clouds from atomic bomb tests at Eniwetok and Bikini Atolls in the Pacific to measure radiation doses in the clouds and to the crew. (Category 11.001, Number 133).

During the early 1950s. Foster D. Snell, a consulting firm, carried out experiments for the U.S. Army by placing "synthetic" radioactive soil on the hands of about 118 human subjects, and measuring the ability of different cleaning agents to remove the contamination. (Category 11.001, Number 134).

From 1961 to 1963, at the University of Chicago and Argonne National Laboratory, 102 human subjects were fed real fallout from the Nevada Test Site; simulated fallout particles that contained strontium, barium, or cesium; or solutions of strontium and cesium. This experiment was designed to measure human absorption and retention of these radioactive substances. (Category 11.001, Number 186, Part A).

During the early 1960s, at the Oak Ridge Institute for Nuclear Studies, 54 hospital patients with normal intestinal tracts were fed lanthanum-140. This experiment was designed to measure the rate at which this radioactive substance passed through the body. (Category 11.001, Number 186, Part B).

During the late 1950s, at Columbia University and Montefiore Hospital, the Bronx, 12 terminal cancer patients were injected with radioactive calcium and strontium. This experiment was designed to compare the distribution of these two substances among body tissues after autopsy. (Category 12.001, Number 15).

In 1967 at the Hanford Environmental Health Foundation and the Battelle Memorial Institute, both at Richland, Washington, radioactive promethium was administered to 14 subjects by injection or drinking. These experiments were designed to measure the passage of this substance through the body and the ability of a drug (chelating agent) to increase the removal of promethium. (Category 12.001, Number 110).

During 1963, at the Battelle Memorial Institute, Richland, Washington, five subjects were injected with radioactive phosphorus. In addition, five subjects were fed fish from the Columbia River which contained radioactive phosphorus, produced and discharged into the river by reactors at the Atomic Energy Commission's Hanford Site. These experiments were designed to estimate the doses to humans eating contaminated fish. (Category 12.001, Number 111).

In many of the reported experiments, radiation was used as treatment for diseases which were resistant to more conventional methods. Most frequently, radiation was used in attempts to treat cancer, leukemia, or other malignant disorders of the blood. The Subcommittee staff does not question these applications, since patients were irradiated in an attempt to treat their diseases, and in some cases the treatment was successful. In these cases, the radiation exposure was meant to carry some medical benefit for patients, and observation of the effects of exposure, which enhanced understanding of radiation effects, was incidental to the treatment. In some cases, however, long term medical follow up of the surviving patients, which might have provided information for useful comparison with other treatments that might seem promising, was not conducted.

The studies provided by the Department of Energy amply demonstrate the need for long term medical follow up. Category 10.001, Number 69, describes a retrospective study on the health of humans exposed to radioactive iodine, and includes as a study population the group of Marshallese Islanders exposed to fallout from early atomic bomb tests. This report notes that thyroid nodules, produced by exposure to radioactive iodine, did not first appear among inhabitants of the atoll with the highest fallout until 9 years after the testing. Nodules began appearing some years later among inhabitants of atolls where the doses were lower; and after 22 years, nodules were still being observed.

If there is one thing the government can do for these experimental victims and their families, even at this late date, it is to conduct long term medical follow up of populations exposed to radioactive material. That practice has been adopted by the Defense Department through its Nuclear Test Personnel Review, a registry for military personnel exposed to fallout from atmospheric nuclear tests. The primary objectives of the Review are to identify the ap proximately 200,000 Defense Department personnel involved in such tests, to determine their exposures, to identify incidences of death or illness, and to assist veterans in claims for compensation. If this effort can be carried out for military personnel acting in the line of duty, surely a similar effort should be possible for the far smaller number of peaceful atomic soldiers used as human subjects in radiation experiments.

RECOMMENDATIONS

1. It seems appropriate to urge the Department of Energy to make every practicable effort to identify the persons who served as subjects for the experiments described below, to examine the long term histories of subjects for an increased incidence of radiation-associated diseases, and to compensate these human guinea pigs for damages they have suffered.

These victims face severe obstacles to compensation under current law, embodied by the Federal Tort Claims Act. The Department of Energy should therefore be encouraged to work with the Subcommittee to develop legislation that provides adequate compensation.

2. Human experiments of this nature must never be repeated. Many of these experiments would not be allowed under current federal guidelines, and it is gratifying that experiments of this nature apparently did not continue after the early 1970s.

Two overriding principles for human experimentation must be followed: The first is that the risks of the experimental treatment must be reasonable in relation to anticipated benefits. The second is that subjects must be fully informed, and capable of understanding the benefits and risks of the treatment. Current federal regulations embody these principles, with exceptions that are clearly spelled out in cases where knowledge from the treatment might benefit society as a whole. The Appendix to this report describes these federal regulations.

The Subcommittee is gratified that the Department of Energy follows current regulations in its own experiments. However, the sad history of human radiation experimentation makes it clear that standards that were acceptable forty years ago appear repugnant today. It therefore seems appropriate to urge that all applicable federal agencies, including the Department of Energy, frequently review their regulations to ensure that human experimentation is conducted under the highest ethical standards.

BACKGROUND

The investigation into human radiation experiments began as part of an ongoing Subcommittee examination of the health and safety policies of the Department of Energy. In June 1984, Representative Richard Ottinger, then Subcommittee Chairman, requested from the Department a list of experiments involving human test subjects and radiation, which were funded by the Atomic Energy Commission, the Energy Research and Development Administration, or the Department of Energy. The former two agencies were predecessors of the Department of Energy. DOE responded to this initial request in September 1984, enclosing summaries of many different experiments. In October 1984, Chairman Ottinger requested further clarification and information on the human experiments provided. DOE responded to this request in January 1985, providing supporting material and fuller descriptions of many of the experiments, and in some cases reporting more experiments.

In January 1985, Representative Edward J. Markey became Subcommittee Chairman, and initiated an intensive review of all the documents released by the DOE. Chairman Markey also requested further information on individual experiments in August, November, and December 1985, and in March 1986.

REVIEW OF RELEASED DOCUMENTS

The initial information released by the Department of Energy consisted of summary factsheets on each of several human radiation experiments. Each factsheet contained an experiment title, designation of federal agency or agencies funding the experiment, a list of institutions conducting the experiments, description of the experiment objective, a short description of the experiment, and where known, the status of long term medical follow up of experimental subjects.

In response to the Subcommittee's October 1984 request for further information, DOE released additional material including dates when experiments started and ended, names of responsible government officials, and in some cases supporting documents, such as scientific references or project reports. DOE also released some material on experiments not previously reported in the summary factsheets.

DOE placed the experiments reported in 12 different categories:

1. Metabolism and Biological Effects of Plutonium, Polonium, Thorium, Uranium, Radium, and Lead-212.
2. Testicular Irradiation.
3. Whole-body Irradiation for Treatment of Leukemia and Lymphoma.
4. Teletherapy with Particle Beams.
5. Other Teletherapy Studies.
6. Treatment of Polycythemia.
7. Hematological Effects.
8. Neutron Capture Therapy.
9. Other Radiation Therapy.
10. Biological Effects of I-131.
11. Other Biological Effects Studies.
12. Metabolic and Physiological Studies.

In many of the reported cases, radiation was used as treatment for diseases which were resistant to more conventional methods. Most frequently, radiation was used in attempts to treat cancer, leukemia, or other maligant disorders of the blood. The Subcommittee staff does not question these applications, since patients were irradiated in an attempt to treat their diseases, and in some cases the treatment was successful. In these cases, the radiation exposure was meant to carry some medical benefit for patients, and observation of the effects of exposure, which enhanced understanding of radiation effects, was incidental to the treatment. The Subcommittee staff readily acknowledges the scientific advancement produced by such observations and commends those scientists and physicians who engaged in such research.

In many of the cases where radiation was used for medical treatment, there was little long term medical follow up of the irradiated patients. In part, this may have been due to the fact that the benefits of medical radiation were clear: irradiated patients in some cases showed higher survival rates than patients treated with other methods. But since radiation can also cause cancer, long term follow up on surviving patients may have provided information for a useful comparison with other present treatments or with treatments that might seem promising in the future.

The follow up provisions of one particular experiment, designated Category 4.004, Number 179, should be noted with approval. The objective of this project is to determine the effectiveness of neutron beam irradiation as compared to standard irradiation for the management of certain malignant tumors. This project is funded by the National Cancer Institute and is carried out at the Fermi National Acclerator Laboratory, a facility owned by the Department of Energy.

This project began in 1975 and is continuing today. Approximately 1400 patients have been referred to the program. Prior to treatment, patients must agree to comply with long-term follow up requirements, which include regular physical examinations and laboratory tests. Every effort is made to contact patients who miss scheduled appointments, and fewer than 1 percent of patients treated at this facility are currently considered lost to follow up. The follow up efforts at this Fermilab project should be applauded, and they represent a model that should be duplicated in other DOE investigations of medical therapy.

In many of the other human experiments which DOE reported to the Subcommittee, however, subjects received little or no medical benefit from their exposure. These experiments fall into two general categories: In one group, human subjects were injected with or fed radioactive material, and its passage through the body was monitored. The major objective of these experiments was to compare results with mathematical models predicting radiation doses for occupational or accidental exposure. Although these experiments did provide information on the retention and absorption of radioactive material by the human body, the experiments are nonetheless repugnant because human subjects were essentially used as guinea pigs and calibration devices. In a second group of experiments, the administration of radioactive material was actually intended to *cause* damage to the human body, and the experimenters sought to correlate the amount of damage done with the dose received.

In some of the experiments described, the human subjects were captive populations: the elderly, prisoners, and hospital patients who might not have retained their full faculties for informed consent. In other experiments, the subjects were volunteers, but they were willing guinea pigs nonetheless.

The human radiation experiments are described in detail in the following section.

8

DESCRIPTION OF HUMAN RADIATION EXPERIMENTS

Category and Number labels below are as designated by the Department of Energy in its responses to the Subcommittee. In many cases, occupational exposure limits are provided for comparison with the doses or amounts of radioactive material received by subjects. Present dose limits are taken from Title 10, Code of Federal Regulations, Part 20. The maximum permissible body burden is an occupational limit for the allowable amount of a given substance that may be internally deposited in an individual. It is generally recognized among the scientific community that doses to the general population should be no more than one tenth the allowable doses to radiation workers. Values presented below for maximum permissible body burdens are taken from NCRP-22, a handbook of the National Committee on Radiation Protection, which is a non-governmental organization that recommends standards for radiation exposure.

In addition to the experiments described in the Summary and Conclusions of this report, many experiments are of special concern because of the circumstances of the persons used as subjects, or because of the doses which some subjects received, relative to present occupational limits. In experiments where the radioactive material administered was greater than the present maximum permissible body burden, doses are classified as potentially greater than present occupational limits, since not all of the material administered might have remained in the body. These experiments of special concern are listed below, and are followed by descriptions of all experiments.

Category 1.001, Number 1. Subjects were diagnosed as terminal within 10 years; one subject was a child; no evidence of informed consent; potential doses much greater than occupational limits.

1.002, Number 118. Subjects were elderly; potential doses greater than occupational limits.

1.003, Number 12. Subjects were terminal patients; potential doses greater than occupational limits.

1.003, Number 119. Subjects were hospital patients; some doses produced kidney damage.

2.001, Number 2. Subjects were prisoners; doses were greater than occupational limits.

2.002, Number 189. Subjects were prisoners; doses were greater than occupational limits.

3.001, Number 49. Doses were greater than occupational limits.

9.001, Number 166. Subjects were terminal brain tumor patients, and most were comatose; some doses produced kidney damage.

10.001, Number 173. Radioactive iodine was intentionally released to the environment.

11.001, Number 51. Doses were greater than occupational limits.

11.001, Number 53. Doses were greater than occupational limits.

11.001, Number 121. Subjects were hospital patients; doses were greater than occupational limits.

11.001, Number 123. Potential doses were greater than occupational limits.

11.001, Number 127. Potential doses were greater than occupational limits.

11.001, Number 133. Doses were greater than occupational limits.

11.001, Number 186, Part B. Subjects were hospital patients; potential doses were greater than occupational limits.

Category 12.001, Number 15. Subjects were terminal cancer patients; potential doses were greater than occupational limits.

12.001, Number 109. Potential doses were greater than occupational limits.

12.001, Number 128. Potential doses were greater than occupational limits.

Category 1. Metabolism and Biological Effects of Plutonium, Polonium, Thorium, Uranium, Radium, and Lead-212

CATEGORY 1.001, NUMBER 1

Plutonium injections into humans

During 1945 to 1947, 18 patients were injected with plutonium. These experiments were carried out by the Manhattan Project. The following hospitals were involved in the experiments, with the number of patients involved for each indicated:

Manhattan District Hospital, Oak Ridge, Tennessee (1).
Strong Memorial Hospital, Rochester, New York (11).
Billings Hospital, University of Chicago (3).
University Hospital, University of California, San Francisco (3).

According to an Energy Research and Development Administration (ERDA) fact sheet of February 1976, the rationale for this experiment was that several thousand Manhattan Project workers had been involved in handling plutonium, accurate information was needed on the retention and excretion of internally deposited plutonium for setting safety criteria, and animal experiments had produced conflicting data which could not be extrapolated to humans.

In choosing subjects, the original criteria specified that subjects should be older, with relatively short life expectancies. All subjects chosen were diagnosed as having existing diseases that gave them an expected survival of less than 10 years. Most were over 45, but one subject was five years old, and another was 18. The oldest patients were 68. The quantities of plutonium injected ranged from 1.6 to 98 times the body burden value recognized at the time of the experiments, where a body burden is the permissible occupational limit for an internally deposited radioisotope. 13 of the patients received between 7 and 10 body burdens. Patients were monitored for their excretion of plutonium. They received no medical benefits from the injections.

In 1967, a Berkeley radiobiologist learned that one of the injected patients had lived for 20 years. She investigated the whereabouts of other patients, and in 1972 published a scientific paper noting that four patients were then alive. In a subsequent follow up investigation, the Department of Energy determined that 9 patients died within 3 years, one in 8 years, one each in 11 and 14 years, and four after 20 years. One was lost to follow up, and one was still living as of October 1983. In one case, the original diagnosis of disease later proved to be inaccurate.

In 1974, following the report that four patients were still alive, the Atomic Energy Commission conducted internal investigations to determine if the experimental patients had granted informed consent for their exposures. A report transmitted in August 1974 found that experimenters had failed to obtain informed consent in several instances. Formalized standards for patient consent to experimental procedures did not exist prior to 1946. In addition, even the word "plutonium" was classified until the end of World War II. The AEC, which succeeded the Manhattan Project, established a policy of formalized patient consent in 1947. One patient, injected in 1947, was the only subject injected after the AEC had been formed. This patient's hospital record contained a statement by attending physicians that the individual had been properly informed of the experimental nature of the injection. The AEC could find no records of consent for any other patient, and determined from oral testimony that at least one patient had not been informed.

On this issue, a June 1983 Department of Energy memo concluded that:

> The issue of informed consent, if raised, will be difficult to deal with in the light of present DOE and Federal policies and procedures regarding human subjects. These are vastly more codified and explicit than any guidance available at the time the injections were given, and the procedures used at that time would not meet standards adopted and currently applied by DOE and other federal organizations. (Memo from Nathaniel F. Barr to Alvin W. Trivelpiece, Director, Office of Energy Research, Department of Energy, June 30, 1983.)

In 1973, the Center for Human Radiobiology (CHR), Argonne National Laboratory, initiated a follow up study of surviving patients and a program to exhume deceased patients for whom permission could be obtained. These studies were designed to examine how much plutonium remained in the bodies of subjects. The 1974 AEC investigations found that even by 1973 standards, informed consent had not been obtained for these studies. A memorandum dated December 21, 1972 from [name deleted], Argonne National Laboratory, to [name deleted], Center for Human Radiobiology, contained the following instructions in regard to studies on the surviving patients:

> Please note that outside of CHR we will *never* use the word *plutonium* in regard to these cases. 'These individuals are of interest to us because they may have received a radioactive material at some time' is the kind of statement to be made, if we need to say anything at all [emphasis in original]. (Quoted in Division of Inspection Report 44-2-326, U.S. Atomic Energy Commission, August 16, 1974, p. 19.)

Consequently, patients alive in 1973 were not informed that they had been injected with plutonium in the 1940s. Relatives of deceased patients were told that exhumation was necessary to determine the composition of an "unknown" mixture of injected radioactive isotopes. Injection was also represented as having been an experimental treatment for the patients' diseases, a statement that is not true. As a second AEC investigation concluded:

> Relative to the study undertaken in 1973, informed consent was not obtained from surviving patients who were the subject of the study.
>
> Consent, following improper disclosure, was obtained from the next of kin of an exhumed patient. Improper disclosure was made to the next of kin of additional deceased patients who have not been exhumed. (Division of Inspection Report 44-2-330, U.S. Atomic Energy Commission, August 12, 1974, pp. 11, 12.)

As a result of the 1974 investigation, the AEC contacted the doctors of the four living patients, and asked the doctors to inform the patients of the nature of the Manhattan Project injections. One doctor did not tell his patient because he felt the information would be detrimental to her health; this patient has since died. The other three patients were informed.

A scientific paper published in 1976 calculated doses to the injected patients, and concluded from these calculations that in spite of the apparent lack of induced tumors among the patients:

> The liver doses do not appear to be high enough to be carcinogenic, but comparison of the bone-surface doses with radium doses that have induced bone tumors indicates that six of these cases have received doses high enough to be considered carcinogenic. (R.E. Rowland and P.W. Durbin, Survival, causes of death, and estimated tissue doses in a group of human beings injected with plutonium, in The Health Effects of Plutonium and Radium, J.W. Press, Salt Lake City, 1976.)

CATEGORY 1.002, NUMBER 118

Administration of radium and thorium to humans

During the period 1961–1965, doses of the nuclides Radium-224, and Thorium-234 were given to 20 volunteers, 13 men and 7 women, aged 63 to 83. Six subjects were injected with radium, six were injected with thorium, one ingested radium, one ingested thorium, and six ingested both radium and thorium. These experiments were funded by the AEC and carried out at the Massachusetts Institute of Technology.

The experiments were designed to examine the metabolism from radioactive substances that might be smiliar to those ingested by radium dial painters in the earlier part of the 20th century, many of whom subsequently developed cancer of the jaw or mouth. The specific matter of concern was whether Thorium-228, which may have been present in dial paints, would have contributed a significant dose to painters. After the subjects were fed or injected with the radioactive substances, the substances were monitored by measuring their presence in blood, in the breath, in excreted matter, and by whole-body counting of the subjects. Patients were monitored for up to 120 days.

Doses given to patients were 0.2 to 2.4 microcuries of radium, or 1.2 to 120 microcuries of thorium. For comparison, maximum permissible body burdens are 0.07 microcuries for Radium-224, and 20 microcuries for Thorium-234.

Most of the subjects were obtained from the Age Center of New England, Boston. A few were retired MIT employees. The subjects received no medical benefits from the experiment.

According to material received from the Department of Energy, the Age Center of New England was a non-profit research facility established in 1954 to investigate the process of aging and the needs of the elderly. The Center's pool of subjects consisted of several hundred "apparently healthy men and women" over the age of 50 who had declared their willingness to be studied in a variety of research projects on aging. These subjects lived elsewhere and had to be active enough to come to the Center to participate in research.

In 1957, the first published annual report of the Age Center described the following ongoing reseach projects: "Correlates of Anxiety in Older Persons;" "The Nutrition of Apparently Normal Aging Persons;" "Prejudice and Older People," and "A Thematic Analysis of Later Life," which obtained the attitudes of elderly persons through questionnaires and oral interviews. The AEC experiments with Age Center subjects thus represent a perversion of the Center's original purpose: Feeding the subjects radium and thorium was of no direct benefit to the subjects or to the elderly population as a whole, and was not related to phenomena connected to the aging process.

The study was conducted in two phases. In the first phase, subjects were injected with either radium or thorium, and the passage of the material through the body was measured. The principal reason for these experiments was to calibrate counting equipment that would be used in the second phase, which was the oral ingestion of mixtures of radium and thorium. Excretion and whole body counting was also monitored for the phase two patients. These experiments were reported to the AEC in annual progress reports in 1964 through 1966.

In a January 2, 1985 letter to the Subcommittee Chairman, the Department of Energy reported that no follow up had been conducted on the health of the experimental subjects. The Age Center no longer exists and one professor who conducted the study had "no idea how any records of survival history could be obtained." He stated that finding the patients, if still alive, may be "like doing a missing persons search." The youngest volunteer would be approaching 85 years old today.

CATEGORY 1.003, NUMBER 12

Polonium administered to humans

From 1943 to 1947, radioactive polonium was injected into 4 hospital patients, and given orally to a fifth. Rates of excretion were measured. These studies were funded by the Manhattan Project and the AEC, and were conducted at the University of Rochester.

The objective of the experiment was to obtain data on human excretion of polonium to obtain a correlation with more extensive data from rats. Hospital patients were used as subjects because the experimenters wanted persons who had not been exposed to polonium through work or accidents.

The experiments were described in a scientific publication: Studies of polonium metabolism in human subjects, Chapter 3 of Biological Studies with Polonium, Radium, and Plutonium, National Nuclear Energy Series, Volume VI-3, McGraw-Hill, New York, 1950. All subjects had incurable diseases. Patient 1 was suffering from lymph cancer, and was injected with 22 microcuries of polonium. Patient 2 had acute leukemia, was injected with 11 microcuries, and died six days later. Patients 3 and 4 suffered from chronic leukemia, and were injected with 12 and 9 microcuries, respectively. Patient 5 suffered from chronic leukemia, and ingested 18 microcuries of polonium Excretion of polonium was followed, and an autopsy was conducted on the deceased patient to determine which organs absorbed the polonium. The age of the patients ranged from early thirties to early forties

The isotope administered is not specified, but the most readily available isotope at the time was Polonium-210. For comparison with the doses, the maximum permissible body burden for Polonium-210 is 0.4 microcuries.

In Janaury 1985, the Department of Energy transmitted to the Subcommittee summary factsheets on this, and many other experiments. The factsheet for this experiment reported no follow up on these experimental subjects.

CATEGORY 1.003, NUMBER 21

Absorption of lead-212 by the human gastrointestinal tract

Lead-212 was fed to three human subjects and gastrointestinal absorption and excretion over 24 hours were examined. Similar measurements were made on two human subjects injected with Lead-212, and the results for ingestion and injection were compared. These experiments were conducted to compare experimental results with existing models used by the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection (NCRP), organizations which recommend radiation exposure standards. These experiments were carried out at the University of Rochester, were funded by the AEC, and were reported in UCRL-18140, Lawrence Radiation Laboratory, University of California, Berkeley, April 1968, pp. 217-232. The material from the Department of Energy on this experiment reported no information on doses, and no follow-up on the experimental subjects.

CATEGORY 1.003, NUMBER 106

Some biological aspects of radioactive microspheres in humans

During the 1960s, 57 normal adults were fed very small spheres containing radioactive Uranium-235 and Manganese-54, to determine how long it would take these spheres to pass through the gastro-intesinal tract. The human subjects received no medical benefit from this experiment.

The experiment was designed to assess the potential hazards from atmospheric reentry and burnup of rockets propelled by nuclear reactors, or of radioactive power supplies. Such burnup could produce particles small enough to be inhaled or ingested. In order to estimate internal radiation doses that humans might receive from such accidents, information was needed on the time that radioactive particles might remain in the body. The human subjects were all workers at Los Alamos Scientific Laboratory, except for one individual who was the wife of the principal investigator.

During the experiment, subjects were given a gelatin capsule containing U-235 and Mn-54, in spheres 100-200 microns in diameter (a micron is one-millionth of a meter). Both U-235 and Mn-54 emit radiation which would penetrate the gelatin. The Mn-54 spheres were coated with ceramic, the U-235 spheres were uncoated. Subjects each swallowed a capsule, and feces were collected and counted to determine how long the capsules remained in the body. One subject repeated ingestion of the sample 10 different times to provide an estimate of variation within the same individual. "Several others" repeated ingestion at different times of the day to provide an estimate of how results might change with time of day.

The experiment was conducted at Los Alamos Laboratory, was funded by the Atomic Energy Commission, and was reported in document LA-3365, Los Alamos Scientific Laboratory, August 1965.

The factsheet which the Department of Energy supplied the Subcommittee reported no follow up on these experimental subjects.

CATEGORY 1.003, NUMBER 119

Injection of uranium salts

During 1946 and 1947, six patients with good kidney function were injected in increasing doses with uranium nitrate, enriched in U-234 and U-235. The objectives of the experiment were to: determine the dose of uranium salt which produced renal injury; measure the rate of excretion of uranium salts; and observe the effects of modifying rates of excretion. These experiments were carried out at the University of Rochester, Atomic Energy Project.

The experiments are described in UR-37, dated June 1948, which apparently was a project report to the Atomic Energy Commission. The human subjects received no medical benefits from these experiments, and in fact the treatment seemed designed to induce kidney injury in at least one patient. It was recognized that uranium salts could damage the kidney, and the experiment planned to identify the concentration that would produce "just detectable renal injury." (UR-37, p. 7)

The experimental subjects were chosen from a large group of hospital patients; those selected had reasonably normal kidney function. In addition, "The probability that the patient would benefit from continued hospitalization and medical care was also a factor in the choice. When higher levels of dosage were contemplated, individuals from the older age groups were preferred in view of the remote possibility that late radiation effects might occur . . ." (UR-37, pp. 8, 9).

Patient 1 was in the hospital because of rheumatoid arthrithis and urethral strictures. Patient 2 was hospitalized because of acute alcololism, "hallucinatory state," cirrhosis of the liver, and possible neural damage. Patient 3 was a young woman "in fairly good physical condition except for mild chronic undernutrition which was thought to be secondary to an emotional maladjustment." (UR-37, p. 18) Patient 4 entered the hospital because of chronic alcoholism and bleeding from the gastrointestinal tract; 12 days after uranium injection, patient 4 was injected with citrate to examine its effect in further removal of uranium. "Unfortunately, this solution was so hypotonic" that blood appeared in the patient's urine and his temperature rose to 39.5 degrees C [103 degrees F]." (UR-37, p. 29).

Patient 5 suffered from chronic cough, had a history of rather high alcohol consumption, and was diagnosed as having pneumonia when he entered the hospital. Uranium doses had been successively increased with each new patient. Patient 5 showed trace amounts of protein in his urine, a sign of kidney disfunction, on the last day before leaving the hospital. He was not followed up. Patient 6 remained in the hospital from October 1946 to April 1947. This was his fifth admission to the hospital. Previous diagnoses had included heart disease, chronic alcoholism, and pneumonia; the present admission was for an ulcer. "As he had no home, he [Patient 6] agreed willingly to enter the metabolic unit for special studies." (UR-37, p. 41) Patient 6 received the largest dose, 70 microgram of uranium per kilogram weight, and clinical analysis suggested that "tolerance had been reached" for kidney injury. (UR-37, p. 55)

The summary factsheet which the Department of Energy submitted to the subcommittee reports no follow up on the experimental subjects. Funding for the experiment is not specified, but it presumably would be from the Manhattan Project, since the AEC was not established until 1947.

Category 2. Testicular Irradiation

CATEGORY 2.001, NUMBER 2

Testicular irradiation of inmates at Oregon State Prison

From August 1963 to May 1971, 67 volunteers at the Oregon State Prison were subjected to testicular irradiation by x-rays. Radiation doses ranged from 8 to 600 roentgen in single acute exposures, except that six prisoners were irradiated a second time, one a third time, and one was given weekly irradiations of 5 roentgen per week for eleven weeks. For comparison, the present occupational limit for exposure to reproductive organs is 5 roentgen per year. These experiments were carried out by the Pacific Northwest Research Foundation, Seattle, the Atomic Energy Commission provided a total of $1.08 million for these studies.

The objective of this experiment was to obtain data on the effects of ionizing radiation on human fertility and the function of testicular cells. It was considered that data from animals could not be readily extrapolated to humans. Studies included examination of testicular tissue, sperm counts, and evaluation of urinary or blood steroids and hormones.

Prisoners ranged in age from 25 to 52. Each inmate agreed to have a vasectomy at the end of his irradiation; consent of wives was required for this procedure. All prisoners in the Oregon group did eventually have vasectomies. All volunteers were required to sign statements of informed consent. Consent procedures involved an explanation of short term and long term effects, including the possibility of testicular cancer. No Catholics were allowed as subjects. Small sums of money were paid to prisoners: $5 to $10 for each treatment, and $100 at the time of vasectomy. However, according to the Energy Research and Development Administration "records suggest that the prime incentive to participate may have been the feeling that they were making important contributions to the state of medical knowledge." (ERDA background information on AEC human testicular irradiation projects in Oregon and Washington state prisons, March 1976, p. 2)

The prisoner irradiation program was terminated in 1973 after the principal investigator suffered an incapacitating stroke, and because of "subsequent state re-evaluation of correctional institutional involvement in experimental programs." (C.G. Heller et al., "Protection of the rights of welfare of prison volunteers: Policies followed throughout a 17-year medical research program," unpublished manuscript, p. 7) The same document noted that the vasectomies on subjects after the experiment were necessary "to avoid any possibility of contaminating the general population with irradiation-induced mutants." (Ibid., p. 5)

In a summary factsheet provided the Subcommittee in January 1985, the Department of Energy described the follow up of experimental subjects:

> Complete recovery as shown by a return to pre-irradiated sperm concentrations and germinal cell numbers was found to be within 9-18 months for doses of 100 rad and below, 30 months for doses of 200 and 300 rad and 5 or more years for doses of 400 and 600 rad.

The need for follow up over a longer term was recognized as early as 1971, in a letter from an AEC official to Carl Heller, the principal investigator for the experiments. The letter concluded,

> Thus, I am suggesting that you prepare a protocol for the long-term follow-up of the irradiated volunteers after their release from the research program. (Frank T. Brooks, Division of Biology and Medicine, AEC, to Carl G. Heller, Pacific Northwest Research Foundation, November 30, 1971.)

In its 1976 background information material, the Energy Research and Development Administration noted:

> ERDA believes that there is a need for continued medical surveillance of prisoners involved in both sets of experiments [Oregon and Washington], and will explore with prison officials the best methods to achieve this. Among health effects which should be monitored is the possibility of testicular tumors, occurring after a long latency period (25-30 years). (ERDA background information, March 1976, pp. 2-3.)

However, at the request of the U.S. Attorney in Portland, Oregon, this follow up program was cancelled after several irradiated inmates filed suits against state and federal governments. In September 1976, the District Court for the District of Oregon dismissed the suit against federal defendants.

The experiments resulted in the publication of several scientific papers. The most recent one cited was M.J. Rowley et al, Radiation Research 59, 665-678, 1974.

CATEGORY 2.002, NUMBER 189

Testicular irradiation of inmates at Washington State Prison

During the period June 1963 to May 1970, 64 inmates at the Washington State Prison received testicular irradiation from x-rays. Each subject was irradiated once, and doses ranged from 7 to 400 roentgen. Following irradiation, tissue samples and sperm were examined for indications of damage; urine samples were examined for hormone levels. The Atomic Energy Commission granted $505,000 to support these studies, which were conducted by University of Washington researchers.

The objective of these studies was to determine the effects of radiation on gonadal function. The studies were reportedly proposed after a radiation accident at the AEC Hanford facility. Three men were overexposed, and no clear scientific data was available to advise them on possible sterility effects. The experiments were designed to determine the minimum effective dose that would render an individual temporarily sterile.

The criteria for selection were similar to the experiments with Oregon inmates: Participants had to agree to vasectomies after completion of the experiment. However, several of the Washington inmates subsequently did not receive vasectomies: 2 declined and were released from prison; 1 declined and remained in prison; 1 was released before the scheduled vasectomy; 1 did not undergo surgery for psychiatric reasons after mutual agreement with the prison physician; 1 who had heart problems and a life sentence was not vasectomized after mutual agreement (AEC Contract AT(45-1)-2225, Task Agreement 6, Terminal Report, January 1973, p. 3) Because of the lack of follow up information, it is not known if any experimental subjects subsequently fathered any children.

The experiments were terminated after a Human Subjects review board at the University of Washington refused in July 1969 to authorize further irradiation of prisoners. (George W. Farwell, University of Washington, to John R. Totter, Director, Division of Biology and Medicine, Atomic Energy Commission, July 16, 1969)

In the factsheet submitted to the Subcommittee in January 1985, the Department of Energy had this description for follow up: "Recovery of cell morphology and function were found after a maximum of 501 days. It was concluded that man is very sensitive in regard to temporary sterility, but is very resistant to complete sterility." As with the Oregon prisoners, there was no long-term follow up of subjects

Several scientific publications resulted from these experiments. The most recent cited was T.W. Thorslund and C.A. Paulsen, in Proceedings of the National Symposium on Natural and Man-Made Radiation in Space, NASA Document NAS No. 2440, pp. 229-232, January 1972.

Category 3. Whole Body Irradiation

In most of the cases in this category reported to the Subcommittee, whole body irradiation was used as treatment for diseases which were resistant to more conventional methods. Most frequently, whole body irradiation was used in attempts to treat leukemia, cancer, or polycythemia vera (a disorder characterized by excessive levels of red blood cells in the blood). The Subcommittee staff does not question the propriety of these particular applications, since patients were irradiated in an attempt to treat their diseases, and in some cases the treatment was successful. However, one case covered below appeared questionable.

CATEGORY 3.001, NUMBER 49

Blood changes in human beings following total-body irradiation

During 1943 and 1944, three groups of persons were given whole body irradiation doses from x-rays. The first group was eight persons with cancer. The second group consisted of one cancer patient and two persons with arthritic conditions. The third group was three normal volunteers. The objective of the study was to observe the changes in blood or blood cells following treatment. Although whole body irradiation was a recognized treatment for malignancies, it provided no benefit to the normal subjects, who received doses which were greater than maximum allowable occupational exposures at the time. In addition, the treatment seemed of little use for arthritis, and the Department of Energy reported in April 1986 that x-ray irradiation for arthritis "is not considered to be standard practice." The experiments were conducted at the University of Chicago and were funded by the Manhattan Project.

The experiment is described in a scientific publication, J.J. Nickerson, Blood changes in humans following total body irradiation, in Industrial Medicine on the Plutonium Project, National Nuclear Energy Series, Vol. IV-20, pp. 308-337, McGraw-Hill, 1951. Page 309 contains the following comment on clinical treatment:

> The people used in groups 1 and 2 were individuals to whom the medical profession could offer no treatment that was at all specific or known to be helpful. The x-ray exposures that were given were as likely to benefit the patient as any other known type of treatment, or perhaps even more likely than any other. Since this manuscript is concerned only with the effects on the blood, the clinical condition of the patients is not discussed at any length.

Group 1 consisted of 8 patients with cancer of the throat, mouth, breast, or larynx. These patients received total body doses of 27, 60, or 120 roentgen in single doses from x-rays. Group 2 consisted of one patient with cancer of the hand, one patient with chronic arthritis who had received no previous known radiation therapy, and one patient with joint stiffness and pain who had received local radiation therapy to the knee. These patients received 500, 300, and 100 roentgen, respectively of total-body doses in multiple doses from x-rays. The radiation produced no significant change in the arthritis of those two patients. Group 3 consisted of three young male subjects who were normal in every known respect. These subjects received 7 roentgen (r) on three successive days, for a total of 21 roentgen from x-rays to each of them. Patients in groups 1 and 2 showed a decrease in the number of lymphocytes in the blood following radiation treatment. Group 3 showed no change in blood elements. For Group 3, the experimenters commented that:

> These cases were of particular interest to us inasmuch as they indicated that acute exposure to far more than the maximum permissible level of 0.1 r per working day could not be expected to produce diagnostic changes in the elements of the peripheral blood which were studied. (Ibid., p. 336)

The summary factsheet which the Department of Energy submitted to the Subcommittee in January 1985 reported no follow up on these subjects.

Category 4. Teletherapy with Particle Beams

These experiments consist of applications of cyclotron beams in attempts to treat patients suffering from cancer or other malignancies. The treatment was applied because conventional methods of therapy had often been unsuccessful in arresting the spread of disease. In some cases, the beam therapy proved more effective than conventional methods. In other tests, this therapy offered no advantages over existing methods and was discontinued. One item reported to the Subcommittee did seem disturbing, because experimental subjects received no apparent medical benefits. This item, in Category 4.006, is discussed below.

CATEGORY 4.004, NUMBER 179

Neutron therapy facility

The follow up provisions of this experiment should be noted with approval. The objective of this activity is to determine the effectiveness of neutron beam irradiation as compared to standard irradiation for the management of certain malignant tumors. This project is carried out at the Fermi National Accelerator Laboratory, a facility owned by the Department of Energy, and is funded by the National Cancer Institute.

The project began in 1975 and is continuing. Approximately 1400 patients have been referred to the program. Prior to treatment, patients must agree to comply with long-term follow up requirements, which include regular physical examinations and laboratory tests. Every effort is made to contact patients who miss scheduled appointments, and fewer than 1 percent of patients treated at this facility are currently considered lost to follow up. The benefits of radiation therapy, when expressed as enhanced survival rates, may be obvious. However, information on longer-term effects of radiation treatment will be useful in comparing results with other techniques in use presently or which may be developed in the future. The follow up efforts at the Fermilab project should be applauded, and should serve as a model that can be duplicated in other DOE investigations of medical therapy.

CATEGORY 4.006, NUMBER 93

Biological effects of heavy ions on human nervous system and vision

During the early 1970s, human subjects were placed within neutron and ion beams at accelerators in Berkeley and Seattle. These experiments arose because astronauts had observed visual light-streak effects while exposed to cosmic rays in space flight. One objective of the experiments was to explore "visual sensations" in humans from exposure to ions. Two subjects observed light flashes in neutron beams of peak energy of 640 million electron volts (MeV); six subjects observed light flashes and dim but definite streaks of 25 MeV peak energy; and two subjects observed light flashes and streaks due to helium ions impinging upon human retina.

These experiments were conducted by the Lawrence Berkeley Laboratory and were funded by the Atomic Energy Commission. They were reported in Nuclear Science Abstracts in 1972 and 1973. The summary factsheet provided by the Department of Energy reports no long term follow up on the human subjects.

Category 5. Other Teletherapy

Projects in this category involved cases where patients whose cancer was not responding to conventional treatment were treated with various types of radiation from accelerators. As before, the Subcommittee staff does not question the propriety of these experiments because they contained a real possibility of benefit for patients.

Category 6. Treatment of Polycythemia

This project was a ten-year attempt, beginning in 1939, to treat polycythemia vera with radiation. The radiation therapy seemed more successful than conventional means of treatment.

Category 7. Hematological Effects

Most of the experiments in this category involved examinations of blood changes of patients who were being irradiated for purposes of diagnosis or treatment. The Subcommittee staff does not question these experiments, since the patients benefited or potentially benefited from the treatment, and the examination of blood changes could provide useful information in designing future treatment.

Category 8. Neutron Capture Therapy

Projects in this category involved the use of beams of neutrons to treat patients with brain tumors. The Subcommittee staff does not question these experiments, since the radiation treatments were meant to benefit patients.

Category 9. Other Radiation Therapy

Most of these projects involved the examination of radioactive isotopes for their ability to treat malignant diseases or to assist diagnosis by concentrating in tumor cells. One experiment, however, raised issues of concern and is discussed below.

CATEGORY 9.001, NUMBER 166

Uranium injected into brain tumor patients

From 1953 to 1957, approximately 12 terminal brain tumor patients were injected with uranium to determine the dose at which kidney damage began to occur. These experiments were conducted at Massachusetts General Hospital, Boston, with assistance from the Oak Ridge National Laboratory, and were funded by the Atomic Energy Commission.

The experiments were conducted to gain data in deriving tolerance doses for workers in uranium processing and fabrication plants. Inhaled or ingested uranium salts are known to produce kidney damage; these experiments were designed to identify the doses at which kidney damage began to occur. Data were also obtained during these experiments on the excretion and retention of uranium in the body. All subjects were terminal brain tumor patients who died within 18 months of the experiments.

An additional stated reason for conducting the experiment was as an initial evaluation of uranium toxicity in developing therapy to treat brain tumor patients with U-235. However, this does not in fact seem to be an important reason for the experiment, since no effort was made to actually treat the brain tumor patients with this isotope. Moreover, neutron capture therapy with U-235 has never been proven as an effective treatment for brain tumor patients.

Several scientific papers resulted from this experiment. One paper, Bernard et al., Proc. Health Physics Soc., 33-48, June 1956, reported the injection of 11 patients, 10 of whom were in coma or semi-coma. One of these patients died in 2.5 days, and one died 18 days after injection. Doses ranged from 4 to 50 milligrams (mg) of uranium. A second paper, A.J. Lussenhop et al., Am. J. Roentgenol. 79, 83-100, 1958, reported on the injection of five patients, four of whom "were in coma or semicoma and remained so until their demise." Patients were injected with 4 to 15 mg uranium. The three patients with the highest doses, 0.12 to 0.28 mg uranium per kg body weight, showed evidence of kidney toxicity. Based on comparisons with animal data, the experimenters determined that a lethal dose for humans would have been 1 mg uranium per kg.

Another paper, S.R. Bernard, Health Physics 1, 288-305, 1958, reports on the injection of eight terminal brain tumor patients, six of whom were comatose. Doses ranged from 4 to 50 mg uranium. There may be some overlap among the patients covered by the three scientific papers. This last paper referred to earlier studies (which were the experiments reported in Category 1.003, Number 119), and notes that these studies lacked some information: "autopsy data were not obtained since none of the subjects were terminal patients." (S.R. Bernard, Ibid., 288) Using terminal subjects thus provided the "advantage" that the distribution of uranium in the body could be determined after autopsy.

Category 10. Biological Effects of I-131

CATEGORY 10.001, NUMBER 69

Study of changes in thyroids irradiated with radioactive iodine

This project, begun in 1951, is a retrospective study of the health of humans exposed to I-131, chiefly for medical reasons. The study has been carried out at Case Western Reserve University, and has been funded sequentially by the Atomic Energy Commission, the Energy Research and Development Administration, and the Department of Energy. This is not considered an experiment, but the project shows clearly the necessity and usefulness of long term medical follow up of irradiated populations.

The significant non-patient population in this study is the group of Marshallese Islanders who were exposed to radioactive iodine from atomic bomb test fallout. The findings on this population were described in TID-27160, a June 1976 Progress Report to the Energy Research and Development Administration. The report noted the long latency period for the onset of clinical effects, and commented on the likely relation between exposure and thyroid nodules:

> The lengthy interval in man is clearly shown in the Marshallese where in spite of thorough annual physical examinations the first palpable nodule was not found for 9 years and neoplasms are still appearing at 22 years. (p. 4)
>
> To date 6 carcinomas have been removed from 10 individuals from several atolls, 3 from an atoll with extremely low exposure. Since this is a population which seldom if ever develops thyroid nodules, the relationship to the radiation which was primarily radioiodine is most impressive. (p. 4)
>
> At the time of the last annual report we described a 21 year old Marshallese who we had just operated for multiple benign adenomas. He was 6 months in utero when his mother was exposed to fallout. The special studies of that thyroid tissue showed

the bizarre nuclear forms recognized as evidence of radiation effect. At the time of preparation of this report, we have just operated and removed several benign but atypical adenomas from the thyroid of his mother who had developed masses in the last year. (p. 5)

The factor of long delay in the development of neoplasms is emphasized in both animals and men . . . . The first Marshallese lesion did not develop for 9 years. Many of the early lesions came from the atoll with the highest fallout (Rongelap). It was quite some years later that lesions began appearing in people who were on the next nearest atoll (Alingnae) where the dose had been somewhat less. While lesions were appearing on the nearer atolls, the low dose received on an atoll much further away (Uterik) seemed to have produced no lesions, but in the most recent years, 8 individuals have been operated and 3 carcinomas found. These observations seem to emphasize the risk of the low dose range. (p. 5).

Nine years after the 1954 thermonuclear bomb accident, the first thyroid neoplasm appeared. (p. 6).

CATEGORY 10.001, NUMBER 165

Milk containing I-131 fed to humans

In 1962, five human subjects drank milk containing radioactive Iodine-131, for periods of time ranging from 1 to 63 days. In the first experiments all subjects drank daily doses of I-131 milk for periods from 4 to 63 days. Doses each day were 150 or 1840 picocuries. The largest dose was 1840 picocuries per day for 63 days, for a total of 115,920 picocuries. In a second experiment, two of the same subjects drank single doses of 92,000 picocuries each. These experiments were funded by the Atomic Energy Commission and carried out by Oak Ridge National Laboratory.

The objective of the experiment was to validate calculations which standard setting organizations were using to establish occupational radiation exposure limits. Subjects drank the milk, radioactive iodine uptake was measured by counting the area around the thyroid, and excretion of iodine was also measured. Cows milk containing radioactive iodine was obtained from an AEC Agricultural Research Laboratory. The Department of Energy reported that no follow up of subjects was conducted. These experiments were reported in a scientific paper, S.R. Bernard et al., Health Physics 9, 1307-1323, 1963.

CATEGORY 10.001, NUMBER 173

Planned radioiodine exposures to humans

From May 1963 to November 1965, radioactive iodine was released intentionally on seven separate occasions. On three occasions, human subjects were exposed. The experiments were funded by the Atomic Energy Commission and were conducted at the National Reactor Testing Station in Idaho.

The experiments were designed to improve knowledge of the transport of radioactive iodine, which is produced by nuclear reactors and nuclear bomb tests, through the air-vegetation-cow-milk sequence in the human food chain. This information was considered desirable in developing reactor siting criteria, in the preparation of safety analysis reports, and as an aid to planning for emergency action after a radiation accident.

Seven separate experiments were conducted. The general design was that radioactive iodine was released in gaseous form, and prevailing winds took the iodine over an area designated the "hot pasture." Monitoring devices in the pasture determined the radioactivity deposited. A herd of cows was then led to the pasture to graze for several days. The cows were milked and the milk monitored for radioiodine. Humans were exposed either by drinking the milk or by direct exposure to the released iodine gas. The experiments collectively were called the Controlled Environmental Radioiodine Tests (CERT).

During Experiment CERT-1, conducted in May 1963, one curie of radioactive iodine was released into the hot pasture. Six cows were placed on the contaminated pasture. Cows were milked twice a day, and the milk from one cow saved for human ingestion. Seven human subjects each drank 0.5 liter of radioactive milk over a period of 18 days. Radioactive iodine uptake was determined by counting the thyroid of each subject. (IDO-12035, Controlled Environmental Radioiodine Tests at the National Reactor Testing Station, U.S. Atomic Energy Commission, June 1964).

Experiment CERT-2 was conducted in September 1964. Approximately one curie of radioactive iodine was again released over the hot pasture. Milk samples were again tested, but were not consumed by humans. Instead, three human subjects were placed on the pasture during iodine relase, and their thyroids counted after exposure. This was not a food chain experiment, but was designed to measure the direct iodine dose from inhalation.

During Experiment CERT-3, conducted in December 1964, and CERT-4 and -5, both conducted in June 1965, no cows or humans were exposed, and measurements were only made on the pasture. Amounts of iodine released were lower than in previous tests. CERT-4 released 0.01 curie; CERT-5 0.1 curie; and the amount released in CERT-3 was not specified. (IDO-12047, Controlled Environmental Radioiodine Tests at the National Reactor Testing Station, 1965 Progress Report, U.S. Atomic Energy Commission, February 1966)

During Experiment CERT-6, conducted in summer 1965, radioactive iodine in the methyl iodide form was released. As the experiment progress report states:

> Unfortunately, several of the vials, each containing 2 curies of methyl iodide-131, were accidentally broken in transit or were leaking when received. Those that were not broken were subsequently opened in the hot cell of the Idaho Chemical Processing Plant (ICPP) and the methyl iodide (2 to 6 curies) escaped to the atmosphere from a 75-meter stack. The stack was located 4 kilometers upwind of the test grid at the Experimental Dairy Farm (EDF). (IDO-12053, Controlled Environmental Radioiodine Tests, Progress Report Number Two, U.S. Atomic Energy Commission, August 1966, p. 2).

Six cows grazed over the 27 acre area of the EDF, and iodine concentration in their milk was determined by counting. In addition, "Several individuals were inadvertently exposed to airborne radioiodine from the leaking and broken containers, and efforts were made to obtain data on the retention of this form of iodine in humans." (Ibid., p. 2) These exposures from ruptured vials occurred over a four-day period, and a few people received multiple exposures; thyroids of these individuals were counted.

Experiment CERT-7 was conducted in November 1965; 1 curie of I-131 in the gaseous molecular form was released over the pasture at the EDF. Six cows grazed, and milk samples were counted. In addition, seven human volunteers were placed seated on the pasture area. Uptake of radioactive material was determined by counting the subjects' thyroids.

The Department of Energy reported to the Subcommittee that no medical follow up of the experimental subjects in the CERT tests was performed.

Category 11. Other Biological Effects

CATEGORY 11.001, NUMBER 51

Reactions of human skin to beta rays

During April and May 1945, two groups of 10 human subjects were exposed to plastic disks containing Phosphorus-32, which emits beta rays. These disks were placed directly on the skin to expose subjects. In one set of experiments, 10 persons were exposed to 140 to 250 rep (roentgen equivalent physical); in a second set of experiments, 10 subjects received a series of four exposures each in doses varying from 635 to 1180 rep. In most instances the forearm was the point of exposure, except for three cases in the second series where the inner mid-thigh was exposed. These experiments were funded by the Manhattan Project and were carried out in Clinton Laboratory, Oak Ridge, Tennessee. (One roentgen equivalent physical of beta rays is approximately one rem. For comparison, present occupational exposure limits are 30 rem per year to the skin, and 75 rem per year to hands and forearms.)

The objective of this experiment was to determine the beta ray dose at which skin erythema (reddening of the skin) would first be seen. In the first set of experiments, 8 of 10 subjects showed a "visible reaction" of mild tanning at a dose of 250 rep. In the second set of experiments, 6 subjects showed erythema at 635 rep, and 8 showed erythema at 813 rep. These experiments were reported in J.E. Wirth and J.R. Raper, Chapter 12, Biological Effects of External Beta Radiation, National Nuclear Energy Series, Volume IV-22E, McGraw-Hill, 1951.

The Department of Energy reported no follow up on these subjects.

CATEGORY 11.001, NUMBER 53

Studies of radium applied to human skin

During 1955, experiments carried out on human subjects demonstrated that the biological effects of Thorium X (Radium-224), as judged by erythema and skin pigmentation, can be increased by using an electrical current to cause greater penetration of the skin by radioactive material. These experiments were carried out at New York University and were funded by the Atomic Energy Commission.

Three subjects were exposed in these experiments. During the experiment, squares of blotting paper saturated with Radium-224 were placed on the forearms of each subject. An electric current was applied for 20 minutes to the paper on the left forearm, and no current was applied to the right forearm. For each patient, the left forearm showed intense reddening after 48 hours, and some skin pigmentation at 75 days after exposure; the right forearms showed no visible reactions at the same times. The Department of Energy estimated that doses to the right forearm were 350 rem, and 1000 rem to the left forearms. Irradiated tissues were surgically removed, and no medical follow up on subjects was conducted. For comparison with the doses, present occupational exposure limits are 75 rem per year to the hands and forearms. These experiments were reported in AECU-3061, Atomic Energy Commission, a publication presented at the Sixteenth Annual Meeting of the Society for Investigative Dermatology, 1955. This publication discusses the application of Thorium X to certain skin diseases, but there is no indication that any of the subjects received medical benefit from the experiment.

CATEGORY 11.001, NUMBER 83

Analysis of illness of children receiving fetal irradiation

In 1948, a program of routine pelvis examination by x-ray early in pregnancy for 1008 mothers who were to bear their first child was carried out at Chicago Lying-In Hospital. The objective of the exposures was to make delivery and labor more predictable and easier by measuring the sizes of pelvis and fetal head. In preceding and succeeding years, no such measurements were made and these groups serve as a control population. The estimated tissue dose to the pelvis for irradiated mothers was 1.5 to 3 rem. About half of these children were also exposed to 5 x-ray films during the first day of life. The estimated dose to new-born infants was 0.5 rem.

The Atomic Energy Commission subsequently funded the Argonne Cancer Research Hospital to conduct analyses of health of the exposed children. Between 1962 and 1965 the parents of these children were contacted and asked for information on diseases and hospitalization. The first study found an increase in benign hemangiomas, a tumor which produces skin discoloration, but no increase in congenital malformations, eye diseases, or malignant tumors. A second survey made between 1966 and 1970 confirmed the results of the first follow up. The Department of Energy commented in 1985 that, "It is hoped that further data will be obtained from these subjects and if possible from their children."

CATEGORY 11.001, NUMBER 112

Human absorption of tritium oxide through skin

During 1951, 14 human subjects were exposed over a small area (about 10 square centimeters) on the forearm (12 subjects) or abdomen (2 subjects) to a water-vapor atmosphere labeled with tritium oxide (HTO). A single subject was in addition exposed over his total skin area while breathing uncontaminated air. Absorption of tritium oxide was estimated by measurments of tritium excreted in urine. The data from these experiments indicated that humans absorbed tritium at a rate 4 times faster than measured for rats. These studies were funded by the Atomic Energy Commission and were conducted by the General Electric Company, Richland, Washington.

The objective of these experiments was to determine the rate of absorption of tritium oxide through human skin. This information would assist in evaluating the hazard to individuals who might handle tritium, which had promise of becoming a widely used tracer isotope for hydrogen. The Department of Energy reported that no medical follow up was carried out on these subjects. These experiments were reported in C.W. DeLong et al., Am. J. Roentgenol. Radium Therapy Nucl. Med. 71, 1038-1045, 1954.

CATEGORY 11.001, NUMBER 121

Effects of x-rays on human fingers

During 1947, fifteen subjects were exposed in the nail fold area of the left fourth finger to doses of 200 to 600 roentgen. (For comparison, present occupational exposure limits are 75 roentgen per year to the hands.) Fourteen of these subjects were patients being treated by x-rays or radium for other purposes, but none of them had received previous irradiation to the hands. The other subject was a staff member who occasionally prepared radium material for treatments. He was observed before and after the preparation of an item containing 130 milligrams of radium. These experiments were funded by the Atomic Energy Commission and were conducted at the University of Chicago.

The objective of the experiment was to examine the changes which may occur in the fingers of persons occupationally exposed to radiation. The left fourth finger was chosen for irradiation because the skin is fairly thin as compared to other fingers, and this finger is "less likely to have been subjected to previous trauma." Microscopic observations were made of the fingers before and immediately after treatment, and for up to two weeks after treatment. Some irradiated patients showed temporary symptoms such as enlarged or broken blood vessels, or reddening of the skin. The report on the experiment noted no permanent changes to the skin of the finger, and concluded with the statement, "It is proposed that test doses be given at higher levels." (CH-3833, Effect of Single Dose X-Ray to the Nail Fold Area of Human Subjects, Preliminary Report, July 1947, p. 4) However, no further experiments were reported. The Department of Energy reported no medical follow up of the subjects.

CATEGORY 11.001, NUMBER 123

Human absorption and excretion of tritium

During 1950, human subjects were exposed to tritium in several different experiments. Subjects were exposed to tritium in air for two hours, and the increase in tritium in body fluids was followed over time. In a second experiment, the arm of a man was immersed up to the elbow in water containing tritium, and the tritium in body fluids was again followed. In a third experiment, a man drank tritium in 0.2 liters of water and absorption into the blood stream was followed. Amounts of tritium administered were up to 3 millicuries. (For comparison, the maximum permissible body burden for occupational exposure is 2 millicuries.) These experiments were funded by the Atomic Energy Commission and carried out at Los Alamos Scientific Laboratory.

The objective of the experiment was to obtain information on the human absorption and excretion of tritium, to aid in the setting of occupational exposure limits. The exact number of subjects exposed in not clear, but it appears that one subject immersed an arm in tritiated water, one subject drank tritiated water, and seven subjects were exposed to air containing tritium. These experiments were summarized in AECU-937, The Absorption, Distribution, and Excretion of Tritium in Men and Animals, U.S. Atomic Energy Commission, November 1950. The Department of Energy reported no medical follow up of subjects.

CATEGORY 11.001, NUMBER 125

Human absorption of tritium liquid and vapor

During 1952, the lower arms of subjects were exposed for variable lengths of time to tritiated water vapor and tritium in liquid water. Tritium activity in subjects' urine was monitored. The Department of Energy provided no further details on this experiment, and reported no follow up of subjects.

CATEGORY 11.001, NUMBER 126

Human absorption of tritium by lung

During 1952, three subjects were exposed in five experiments to tritiated water vapor. Subjects breathed tritium-saturated oxygen for 4 to 5 minutes. The tritium retained in the body during the exposure was obtained by comparing the tritium inhaled with the tritium exhaled. Retention and excretion of tritium with time were monitored through blood and urine samples. This experiment was funded by the Atomic Energy Commission and carried out at Los Alamos Scientific Laboratory.

Subjects inhaled from 0.8 to 1.0 millicuries of tritium. This can be compared with the maximum permissible body burden of 2 millicuries.

The objective of the experiment was to obtain information on absorption and retention of tritium to aid in establishing occupational exposure standards. The experiment is reported in LA-1465, Lung Absorption of HTO by Man Upon Inspiration of HTO Water Vapor, Los Alamos Scientific Laboratory, June 1952. The Department of Energy reported no medical follow up of the subjects.

CATEGORY 11.001, NUMBER 127

Human absorption of ingested tritium water

During 1952, five experiments were conducted on three subjects in which the subjects drank water containing tritium. Retention of tritium in the body was examined by taking blood and urine samples over time and counting. The experiments were funded by the Atomic Energy Commission and were carried out at Los Alamos Scientific Laboratory.

The objective of the experiments was to obtain data that would assist in evaluating the hazard of ingested tritium. Two subjects each drank 1.6 millicuries of tritium; the third subject drank 6.2 millicuries in three separate experiments. For comparison, the occupational body burden is 2 millicuries. The experiments are reported in LA-1464, The Absorption of Ingested Tritium Water and the Water Dilution Volume of Man, Los Alamos Scientific Laboratory, June 1952. The Department of Energy reported no follow up on the subjects.

CATEGORY 11.001, NUMBER 133

Radiation exposure of aircrews in mushroom clouds

The U.S. Air Force sent manned planes through radiation clouds ("mushrooms and stems") from atomic bomb tests to measure radiation doses in the clouds and to the crews. The detonations were part of Operation Redwing, a series of 17 nuclear tests in the multimegaton range, at Eniwetok and Bikini Atolls in the Pacific, from May–July 1956. The planes, five different B-57Bs, made 27 passes through clouds from six different nuclear explosions, at times from 20 to 78 minutes after detonation. 16 passes were earlier than 45 minutes and 7 were earlier than 30 minutes after detonation.

Maximum radiation doses in the cloud were 800 roentgens per hour. Total radiation doses to crew members were as high as 15 roentgens by film badge. (For comparison, the present maximum annual dose for workers is about 5 roentgen; one chest x-ray represents 0.02 to 0.04 roentgen.)

The objective of the project was to obtain radiation dose information, in the event that an "operational situation" required flights through such clouds. The information was to assist Air Force commands in planning to insure the "most-effective utilization, consistent with crew safety, of aircraft in cloud areas."

Earlier operations had been conducted where drone aircraft were sent through clouds to obtain dose information. The report also mentions manned penetrations made during Operation Teapot. These passes were made from 17 to 41 minutes after detonation. The report on Redwing deletes information on doses measured during the Teapot flights, and gives no reference to any other published report on Teapot. The Redwing flights are described in ITR-1320, Preliminary Report, Operation Redwing: Early Cloud Penetrations, Armed Forces Special Weapons Project, May–July 1956.

On November 13, 1985, the Subcommittee chairman released this document to make it available for a hearing before the Senate Veterans Affairs Committee the following day on compensation for veterans exposed to atomic tests. The document was described in subsequent press accounts.

The Department of Energy reported no medical follow up on the exposed aircrews. However, subsequent correspondence between the Subcommittee and the Defense Department provided more information. The Defense Nuclear Agency (DNA) reported that seven of the Redwing crew members received doses greater than five rem by film badge, and were notified by the Nuclear Test Personnel Review (NTPR), a program to identify veterans exposed during atomic testing. Under this program, persons with exposures greater than five rem per year are notified and encouraged to undergo a special physical examination at the nearest Veterans Administration hospital. None of these seven have reported medical problems attributable to radiation exposure.

In addition, the Redwing aircraft were contaminated with radioactive material as a result of flying through the clouds. The planes were subsequently decontaminated by ground personnel. The DNA retains the exposure records of these personnel, as well as those of all aircrew members, and all these personnel are recorded as part of the NTPR. The DNA maintains a toll free number which veterans who believe they were exposed to atomic tests can call to report their circumstances. (Letter from Lieutenant General John L. Pickitt, Director, Defense Nuclear Agency, to the Subcommittee Chairman, December 11, 1985.)

In December 1985, Chairman Markey joined with Senator Cranston to request a General Accounting Office investigation on atomic cloud fly-through operations. GAO was asked to determine how many air crew members and how many ground presonnel were exposed during Redwing and other such operations, what doses these personnel received, and what follow up the Defense Department has conducted on all personnel.

CATEGORY 11.001, NUMBER 134

Radioactive material placed on human skin

In 1953, Foster D. Snell, a consulting firm, placed synthetic radioactive soil on the palms of over one hundred human subjects, and examined the ability of different cleaning agents to remove the radioactive material. The objective of this experiment was to determine the efficiency of various cleaning agents in removing radioactive contaminants from "human skin and hair."

These experiments were performed for the Chemical and Radiological Laboratories of the Department of the Army, and were reported in a U.S. Atomic Energy Commission technical publication, Removal of Radioactive Contaminants from Human Skin, NP-4935, June 15, 1953. It appears that at least part of the reason for conducting the experiments was to provide information that could be used on a battlefield during a nuclear exchange, since there is a reference to decontamination "from the point of view of the soldier in the field." (NP-4935, pp. 165,166)

For the experiments, a drop of a liquid mixture of radioactive material was deposited on the palms or arms of human subjects, allowed to dry, and counted with a Geiger counter. The contamination was then washed off with various cleaning agents, and the skin counted again to determine efficiency of removal. Initial experiments were conducted on metallic surfaces, then on rabbits and pigs. Preliminary work was also done on hair removed from humans, and then on 16 human subjects. Most of this work was done with a suspension of "synthetic soil," a mixture composed chiefly of soil, sand, and clay, mixed with fission products. Some experiments were performed with synthetic soil which had been irradiated in a nuclear reactor, synthetic soil mixed with Carbon-14, or a sample of soil from the Nevada test site. These other mixtures did not adhere well to skin, and were not used in later experiments. In these first human experiments, solutions registering up to 2,900 counts per minute were placed on subjects' forearms or palms. These experiments showed that it was most difficult to wash radioactivity from palms, and most subsequent experiments placed the radioactive material on palms only.

Subsequent experiments were conducted on about 102 different human subjects, placing larger amounts of radioactivity, typically 10,000 to 20,000 counts per minute, on subjects' palms. A variety of detergents and hand creams were examined for their ability to remove the radioactive contamination. One set of experiments was conducted with "radiological warfare agents," composed of small pellets of zinc bromide which contained radioactive Tantalum. Droplets containing 13,000 to 49,000 counts per minute of these agents were placed on the palms of six human subjects.

One set of experiments was conducted with employees at the Monsanto Chemical Company's Mound Laboratory, Miamisburg, Ohio. A mixture of contaminants containing alpha emitters, and not further identified, was placed on the palms of four employees and detergents tested for removal. In addition, detergents were tested on the hands of three other employees "whose hands were contaminated in the normal course of work." (NP-4935, p. 152).

Except for the experiments at Mound Laboratory, the Department of Energy has not been able to identify where these experiments were conducted or how the 118 human subjects were obtained. Subjects were male and female, and ranged in age from 18 to 66. The Department of Energy reported no medical follow up on any of these subjects.

CATEGORY 11.001, NUMBER 183

Medical follow up studies

In its factsheet on this project, the Department of Energy described follow up studies to assess the long range health of several different populations which have been exposed to radiation. These studies have been funded by the Atomic Energy Commission, the Energy Research and Development Administration, and the Department of Energy. Some of them started in the 1950s, and they continue at present. The studies are being carried out at the Argonne Cancer Research Hospital (ACHR), Argonne National Laboratory. The studies are described below:

1. For 20 years, a joint study of more than 400 persons bearing a considerable body burden of radium has been under way. Most of these persons were painters of the radium dials on luminous watches at various plants in the Illinois River valley region during 1920-1930; others received radium chloride by injection or orally as a medical treatment between 1920 and 1933. Persons with a considerable body burden of radium were found to have characteristic defects, destructive changes, and tumors in the skeleton. These studies include accurate estimates of the body content of radium by using a total body counter; through analysis of the expired breath for the gas radon, a radium decay product; by film exposure from subjects' bodies; and through studies of the blood to reveal if destructive or malignant changes have taken place.
2. A long term follow up study is under way to examine about 1000 children who were exposed before birth to x-rays during pelvic

examinations of their mothers. This study, which extended over about 25 years, is described as Category 11.001, Number 83.

3. A follow up study is under way on patients who had received radiation therapy for stomach ulcers. This study was funded by the Department of Energy, and revealed "some positive findings," which are not further specified. The study is now to be resumed under support from the National Institutes of Health.

4. During the 1950s, persons who received short treatments with low-voltage x-rays for benign conditions of the head, neck, and upper thorax during childhood were studied for possible development of carcinoma of the thyroid. All of the children with cancer of the thyroid who had been treated or seen by the investigator had been irradiated previously in such a way that the thyroid gland or portions of it had been included in the radiation field.

CATEGORY 11.001, NUMBER 186, PART A

Human ingestion of fallout

Concern about problems from the ingestion of fallout led to studies using real fallout from the Nevada Test Site; simulated fallout particles that contained Strontium-85, Barium-133, or Cesium-134; and solutions of Sr-85 and Cs-134. During 1961 to 1963, real and simulated fallout and solutions of strontium and cesium were fed to 102 human subjects. Absorption and retention of the ingested radioactivity was measured by counting the bodies of subjects. These experiments were funded by the Atomic Energy Commission and were carried out by the University of Chicago and the Argonne National Laboratory. Subjects were university students or members of the researchers' staffs.

Several different fallout or simulated fallout materials were prepared. One set of experiments used microscopic spheres of radioactive strontium, cesium, or barium. A total of 27 volunteers ingested the spheres. Transit time of the spheres through the gastrointestinal tract was measured by counting excreted matter. A second set of experiments used real fallout, obtained from the Nevada Test Site following land detonation of the nuclear test Small Boy, on July 14, 1962. Fallout samples were placed in gelatin capsules and were fed to 10 subjects. In these and subsequent experiments, retention of activity was followed by counting subjects' bodies.

Two types of simulated fallout were also prepared. They were distinguished by the size of microscopic spheres used, which simulated the size of fallout particles close to or far from the site of detonation. 21 subjects were fed simulated local fallout, and 22 simulated distant fallout. Finally, 22 subjects were fed solutions of strontium or cesium. The amounts of radioactive material fed to subjects in all experiments ranged from 0.4 to 2.5 microcuries of Strontium-85, or 0.5 to 14 microcuries of Cesium-134. These values can be compared with the maximum permissible occupational body burdens of 60 microcuries for Strontium-85, and 30 microcuries for Cesium-134.

The Department of Energy reported no long term medical follow up on these subjects. These experiments were reported in a scientific paper, G.V. LeRoy et al., Health Physics 12, 449–473, 1966.

CATEGORY 11.001, NUMBER 186, PART B

Lanthanum-140 administered to humans

The paper cited in Number 186, Part A, G.V. LeRoy et al., reported an earlier study in which 54 hospital patients were fed radioactive Lanthanum-140, and the passage of material through the gastrointestinal tract was measured by counting excreted matter. It appears that the Department of Energy did not report to the Subcommittee on this experiment, but it was published in R.L. Hayes et al., Health Physics 9, 915–920, 1963, and the Subcommittee obtained a copy of the original reference from the Library of Congress, Congressional Research Service. This experiment was carried out at the Oak Ridge Institute of Nuclear Studies, and was funded by the Atomic Energy Commission.

The objective of this experiment was to measure the movement of radioactive material through the human body, and estimate the dose to the lower large intestine from materials that the body does not absorb. The experimenters noted that movement through the body varied with individuals, and these experiments attempted to measure the extent of such variation.

Subjects were fed 10 or 20 microcuries of Lanthanum-140. (For comparison, the maximum permissible body burden for occupational exposure is 10 microcuries.) Movement of this substance through the body was examined by collecting fecal samples and counting. Subjects were patients from the clinical program at the Oak Ridge Institute, and ranged in age from 7 to 76. All subjects were selected because they had normal intestinal tracts, which were not affected by their diseases. Subjects thus received no medical benefit from the experiment. To measure variability in individuals, 8 subjects were fed lanthanum twice, and one was fed three times.

Category 12. Metabolic and Physiological Studies

CATEGORY 12.001, NUMBER 15

Strontium and calcium injected in terminal cancer patients

The material which the Department of Energy submitted to the Subcommittee on this project included ANL-6104, a 1959 report from the Argonne National Laboratory. This report summarized data on the retention by humans of calcium, strontium, and radium. One of the references cited was Schulert et al., Int. J. Applied Radiation and Isotopes 4, 144–153, 1959. The Department of Energy did not supply this reference, but the Subcommittee obtained a copy of the original through the Library of Congress, Congressional Research Service.

In these particular experiments, radioactive Calcium-45 or Strontium-85 were injected into twelve terminal cancer patients, and the distribution of each substance in tissue and bone was determined at autopsy. These experiments were carried out at Columbia University and the Montefiore Hospital, Bronx, New York.

The objective of these experiments was to measure the absorption by different parts of the body of strontium, a product of nuclear fission and a component of nuclear weapons fallout. In order to help evaluate the hazards of strontium to humans, the experimenters desired to determine the retention by different tissues of strontium compared to calcium; strontium mimics calcium chemically and concentrates in bone. As the scientific paper explained, subjects were chosen so they could be autopsied fairly soon after injection: "Since autopsy analyses were employed, the patients were, of necessity, of limited life expectancy with cancer involvement, and cannot be considered as normal healthy adults." (Schulert et al., 145)

Ten patients were injected with about 1.5 microcurie per kilogram body weight of Strontium-85, and about 0.4 microcurie per kilogram of Calcium-45. Total doses would have been 64 to 114 microcuries of strontium, and 17 to 30 microcuries of calcium. For comparison, the occupational maximum permissible body burdens are 60 microcuries for Strontium-85, and 200 microcuries for Calcium-45. These patients lived from 3 hours to 124 days. An additional terminal patient injected with strontium only survived for 251 days, and one patient injected with calcium only survived for 960 days. Patients ranged in age from 49 to 72.

CATEGORY 12.001, NUMBER 109

Technetium administered to humans

During 1965, Technetium-95 (metastable) and -96 were administered to 8 subjects. Retention and absorption of technetium were monitored by counting the bodies of subjects and by counting excretions. Doses were administered to subjects at the University of Washington, counting was carried out by the Pacific Northwest Laboratory, Richland, Washington. The Atomic Energy Commission funded the work of the Pacific Northwest Laboratory.

Technetium is a product of nuclear fission and is present in rather high concentrations in wastes from nuclear reactors. At the time of these experiments, technetium was being separated from nuclear wastes at the federal facility near Richland, Washington. In addition, technetium was also used for medical diagnoses. The objective of these experiments was to obtain information on the retention of technetium in the body, to help assign occupational exposure limits.

Four subjects were injected, and four subjects were fed technetium. Each subject received 20 microcuries of Tc-95m and 60 microcuries of Tc-96. (For comparison, the occupational maximum permissible body burdens are 70 microcuries for Tc-95m and 10 microcuries for Tc-96.) Samples of sweat, plasma, tears, urine and feces were collected, and observations were made for up to 60 days on some subjects.

These experiments were reported in a scientific paper, T.M. Beasley et al., Health Physics 12, 1425–1435, 1966. The Department of Energy reported there was no long term follow up of these subjects.

CATEGORY 12.001, NUMBER 110

Promethium administered to humans

In 1967, Promethium-143 was administered to 14 subjects. Absorption and retention were followed by counting the bodies of subjects, and by measuring the activity in blood and excretion samples. 6 subjects were injected with promethium and observed for retention. 2 subjects drank orange juice with promethium in solution. 6 subjects were injected with promethium and then injected with the chelating agent diethylenetriaminepentaacetate (DTPA), and the ability of DTPA to remove promethium from the body was examined. These experiments were funded by the Atomic Energy Commission and were carried out by the Hanford Environmental Health Foundation and the Battelle Memorial Institute, both at Richland, Washington.

The experiments were conducted to determine the uptake, retention, distribution, and excretion of promethium in humans. The information obtained would help to develop an excretion model for diagnosis of promethium in humans, to form a basis for radiation exposure, and to determine the dose from accidental exposures. These considerations were relevant to occupational exposure of persons handling promethium.

Injected subjects received 0.1 microcuries of promethium. Two subjects drank 10 microcuries of promethium. Administered preparations were mostly PN-143, but some Pm-144 was also present. Little promethium was retained by the two subjects who drank it. However, about half of the injected promethium deposited in the liver within a few minutes, and most of the remaining promethium deposited in the bone within the next 5 hours. Subjects were followed for one year, during which this distribution remained unchanged. The effectiveness of DTPA in enhancing excretion of promethium declined with time: When DTPA was injected 30 minutes after promethium, it removed 90 percent of the radioactive material; after 24 hours, it removed only 25 percent; and after 80 days, it removed only 5 percent.

These experiments were reported in a scientific paper, H.E. Palmer, I.C. Nelson, Health Physics 18, 53-61, 1970. The Department of Energy reported that no follow up was conducted beyond the one year observation after the experiment.

CATEGORY 12.001, NUMBER 111

Phosphorus-32 injected into humans

During 1963, five subjects were injected with Phosphorus-32. Three of the subjects were patients at the University of Oregon Medical School who received the P-32 as part of the therapy for blood diseases. The other two subjects were injected at the Swedish Hospital in Seattle for purposes only of calibrating equipment. These experiments were funded by the Atomic Energy Commission and carried out by the Battelle Memorial Institute, Richland, Washington.

The reasons for carrying out these experiments were described in a scientific paper:

> Fish and waterfowl that feed in the Columbia River downstream from the Hanford reactors acquire some radionuclides that enter the river with the effluent water (1) 32-P and 65-Zn are the principal nuclides found, and suckers and whitefish usually contain the greatest concentration of these nuclides Since sportsmen obtain and eat the waterfowl and fish from the Columbia River below Hanford, a method of measuring the low level body burden of these nuclides in humans is needed Since 65-Zn is a gamma emitter, body burdens down to 1 nc [nanocurie] can easily be measured in a whole-body counter Foster (2) has described an experiment in which

> a subject ate a weekly meal of whitefish and the accumulation of the 65-Zn in the body was studied. 32-P does not emit a gamma ray and it is much more difficult to measure. This paper describes a method by which body burdens of 32-P down to 40 nc can be measured (H.E. Palmer, Health Physics 12, 605 608, 1966. References 1 and 2 are publications designated HW 80991, 1964; and HW-SA-3060, 1963. These are probably Atomic Energy Commission documents.)

One subject was injected with 425 nc of P-32. A second subject was injected with 500 nc, then reinjected after 28 days with 425 nc more. Injection doses for the other subjects were not reported. This same scientific paper reported another experiment where humans ate radioactive fish:

> One reason for developing a sensitive, in vivo counter for 32-P was to measure people who eat Columbia River fish. The significance of this intake with relation to the maximum permissible body burden has been discussed in another publication. (1) Five subjects ate ¾ lb each of whitefish which had been caught in the Columbia River. After allowing 1 day for absorption of the 32-P, the subjects were measured for 20 min with the [radiation] counter and showed body burdens of 70, 110, 89, 72, and 93 nc . . . . The maximum permissible body burden for occupational exposure is 6000 nc.: (Ibid., 607. Reference 1 is HW-80991.)

The Department of Energy reported that no follow up was conducted on these experimental subjects.

CATEGORY 12.001, NUMBER 128

Humans inhaled tritium

During 1950, six subjects each inhaled "a few" millicuries of tritium. (For comparison, the maximum permissible occupational body burden for tritium is 2 millicuries.) Tritium concentration in urine was monitored for the following 15 days. These experiments were funded by the Atomic Energy Commission and were carried out at the Los Alamos Scientific Laboratory, New Mexico.

The objective of this experiment was to investigate the rate of appearance of tritium in urine. This knowledge would help in the establishment of occupational exposure limits. No follow up on these subjects was reported.

CATEGORY 12.003, NUMBER 174

Radioactive material administered to humans to calibrate equipment

Between 1965 and 1972, 8 individuals were involved in 13 different human experiments. All eight were employees of the Idaho Division of the Atomic Energy Commission. In four experiments, subjects inhaled Argon-41; in nine experiments, subjects swallowed capsules containing microcurie amounts of radioactivity. These experiments were funded and carried out by the Atomic Energy Commission.

The objective of this experiment was to calibrate instruments that measure radioactive substances inside the human body; such instruments are usually used to examine workers accidentally exposed or hospital patients receiving radioactive material for diagnostic purposes. A secondary objective of the experiments was to examine the metabolism of radionuclides ingested or inhaled by humans.

Some of these experiments were reported in scientific papers. In the first set of experiments, one subject was fed one microcurie of

Manganese-54; another subject was fed an unspecified amount of Iodine-131 (J.I. Anderson and D.G. Olson, Health Physics 13, 719-732, 1967). In a second set of experiments, individual subjects were fed 3.5 microcuries of Cesium-132, 1.9 microcuries of Potassium-42, or 1.1 microcuries of Manganese-54. In addition, 4 subjects inhaled Argon-41 in amounts of 1.3 to 2.2 microcuries (D.G. Olson, Health Physics 14, 439-447, 1968). In a third experiment, one subject was fed 1.5 microcuries each of Cobalt-60 and Cesium-137 (J.I. Anderson and D.G. Olson, Health Physics 23, 325-332, 1972).

The Department of Energy reported there was no medical follow up of any of these experimental subjects.

APPENDIX

CURRENT FEDERAL REGULATIONS ON THE PROTECTION OF HUMAN SUBJECTS

Current regulations on the use of human subjects for experiments are described in Title 45, Code of Federal Regulations, Part 46 (45 CFR 46), revised as of October 1, 1985. These regulations call for special requirements when prisoners, children, or other specified categories of persons are used as subjects.

GENERAL PROVISIONS

Experiments on human subjects must satisfy the following criteria:

(1) Risks to subjects should be minimized.

(2) Risks to subjects should be reasonable in relation to anticipated benefits, and the importance of the knowledge that may reasonably be expected to result.

(3) Subjects should be selected in an equitable manner.

(4) Informed consent shall be sought from each prospective subject or the subject's legally authorized representative. Informed consent includes a clear description of the risks and benefits of the experimental procedure. (45 CFR 46.111)

PRISONERS

Biomedical or behavioral research may involve prisoners as subjects only if the purpose of the proposed research is to:

(1) study the possible causes, effects, and processes of incarceration or of criminal behavior;

(2) study prisons as institutional structures or prisoners as incarcerated persons;

(3) conduct research on conditions particularly affecting prisoners as a class (for example, vaccine trials or other research on hepatitis, which is more prevalent among prisoners than the general population);

(4) examine practices, both accepted and experimental, which have the intent and reasonable probability of improving the health or well-being of the subject. (45 FR 46.306)

CHILDREN

A child is an individual who has not attained the legal age for consent to treatments or procedures involved in the research, under the applicable laws of the location where the research is to be conducted (45 FR 46.402)

A child may be used as a subject only upon receipt of permission from parents and assent from the child, under conditions where the child is judged capable of providing assent (45 FR 46.408). If permission and assent are obtained, research can be conducted only if one of the following conditions is met:

(1) The research poses no greater than minimal risk (45 FR 46.404).

(2) The research presents more than minimal risk, but the procedure holds out the prospect of direct benefit for the individual subject or is likely to contribute to the subject's well-being (45 FR 46.405).

(3) The research presents more than minimal risk, does not hold out the prospect of direct benefit to the subject, but the procedure is likely to yield generalizable knowledge about the subject's disorder or condition which is of vital importance for understanding the disorder or condition (45 FR 46.406).

(4) The research presents a reasonable opportunity to further the understanding, prevention, or alleviation of a serious problem affecting the health or welfare of children (45 FR 46.407).

OTHER SUBJECTS

Where some or all of the human subjects are likely to be vulnerable to coercion or undue influence, such as persons with acute or severe physical or mental illness, or persons who are economically or educationally disadvantaged, appropriate additional safeguards must be included in the study to protect the rights and welfare of these subjects. (45 FR 46.111)

It should be noted that under these regulations, the experiments previously described with prisoners, and which used minors as subjects, would have been strictly prohibited. In addition, many other experiments used patients with severe illnesses or who were disadvantaged, and there is no indication that safeguards were incorporated into the experiments to protect these subjects.

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Mr. BRYANT. Thank you. We thank you for your early pursuit of this difficult topic at a time when it was a less fertile field to plow.

Our next witness is Congressman Frost, whose district includes actual victims of this activity and who has introduced legislation to provide for the compensation of those who were injured by it.

I invite Congressman Martin Frost to testify.

STATEMENT OF HON. MARTIN FROST, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. FROST. Mr. Chairman, thank you, and I would like to join all of you in recognizing and commending the pioneering work that our colleague, Ed Markey, did in this area, who was a voice in the wilderness, but is not in the wilderness any longer.

Mr. Chairman, I appreciate this opportunity to testify today on the recent disclosures that the U.S. Government conducted secret radiation experiments on its citizens beginning in the 1940's. Over the past few months, we have been hearing about some of these experiments. We have learned, for example, that mentally retarded children were fed food containing radioactive material. We learned that pregnant women were given radioactive medication. We have learned about radiation experiments conducted on veterans in VA hospitals and we have learned about 18 individuals being injected with plutonium.

One of the people injected with plutonium, Elmer Allen, lived in my congressional district in Texas. Believing he was being treated for bone cancer, Mr. Allen received an injection of plutonium in 1947. Although doctors did not expect him to live long, Elmer Allen lived another 44 years, but those were difficult years for a man troubled by numerous illnesses and health problems.

Neither he nor his family ever knew for certain that he had become a guinea pig for Government scientists, though he often told others he had been the subject of some kind of experiment. His story was recently told in an Alburquerque Tribune story by reporter Eileen Welsome. I would like to subject a copy of this story and make it a part of the subcommittee's record.

I have been working with the Allen family to obtain the release of all of the relevant reports and documents pertaining to Elmer Allen's case. Secretary of Energy Hazel O'Leary has personally committed to me that she will do everything she can to get this information to the Allen family so that they can learn the truth.

While we are still learning about the experiments, we do know this much: Many of the radiation experiments were conducted without the person being tested ever knowing what is happening. Rather than informing these people about the nature of the experiments and the likely risks, the Government and its scientists simply found opportune moments to conduct the experiments secretly.

What the Federal Government did to these individuals was outrageous. Experiments like these happened in Nazi Germany and in the old Soviet Union, not here. Unfortunately, we are now learning that they did happen here. Now we have to decide what we are going to do for these victims who are still living or for the families of those test subjects who are deceased.

I applaud both President Clinton and Secretary O'Leary for the steps that have been taken to learn more about the nature and extent of the testing that took place. They are pledged to locate the relevant records and documents and inform the families of the results.

The question of compensation has also been discussed. Both President Clinton and Secretary O'Leary have stated that they support the idea of compensation. I have introduced a bill, the Radiation Experimentation Compensation Act, H.R. 3743, that would provide compensation to the individuals who were experimented on and their families.

My bill would authorize the payment of $50,000 to each person who, without giving informed consent, was the subject of an intentional radiation experiment. A process would be set up by the Attorney General to review claims and determine which ones are eligible for compensation.

As you are aware, Mr. Chairman, there is a precedent for compensating victims of radiation testing, as you indicated in your opening remarks. In 1990, Congress approved the Radiation Exposure Compensation Act to provide payments for those who had lived downwind of nuclear weapons tests as well as for uranium miners.

My bill looked at the Radiation Exposure Compensation Act as a model and borrowed many of its provisions. There is one significant difference between the act and the bill I am proposing. The earlier act links compensation to the subsequent development of certain types of cancer. My bill presumes that people secretly tested on have been harmed by the very act of the experiment; therefore, compensation is linked to a showing that the claimant was in fact the subject of a secret radiation test.

Admittedly, we may still be learning about how well the earlier act has worked in practice and given the similarities between the legislation and mine, I am interested in the assessments of this subcommittee on that issue.

We can never fully compensate these people for what their Government has done to them. However, we can provide some measure of relief with this payment and recognition that the U.S. Government was wrong to conduct secret experiments on its own citizens.

Again, Mr. Chairman, I appreciate this opportunity to testify today.

Mr. BRYANT. Thank you for being here and for offering your testimony.

Our next witness is Congressman Porter Goss, who quite some time ago revealed the mustard gas experiments that fall into somewhat the same vein as the recent radiation discussed and his activity resulted in action by the Veterans' Administration. We are delighted to have him here today to discuss the mustard gas aspects of this.

STATEMENT OF HON. PORTER GOSS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. GOSS. Thank you, Mr. Chairman, members of the committee. I ask that my full statement be entered into the record and I will abbreviate.

I, first of all, want to start out by echoing the applause that I think you deserve for opening and broadening this conversation and this testimony to beyond the radiation victims, because I think we are talking about Government accountability for things that are not acceptable, and I think we are definitely in a framework that makes sense.

I would not want to take in any way away from the efforts of Mr. Markey or any others who are here primarily because of the radiation testing, but I think that the parallels are absolutely remarkable with the mustard gas and lewisite gas victims, and I presume there is other testimony on some of the other testing that was done as well.

It seems to me that we are now in the process of piercing the veil of secrecy that has gone on very well, and I would like to compliment very much this subcommittee which has really been an island of action in a sea of red tape. Under Chairman Barney Frank's leadership, we finally made the first steps with the mustard gas victims, and I don't think it would have happened without this subcommittee's interests and efforts. I think you are going to be in a position again to make things happen, and that is why this is doubly important today.

I congratulate you for what you have done, what you are doing and I suspect what you are going to do as well.

I think that even though we have made a great deal of progress with the mustard gas victims, their plight providing some individual relief and so forth, there is obviously more to do. There is a bill out there that I am sure you have heard of, H.R. 1055, which has a hearing coming before the Armed Services Subcommittee very soon, in February. It has a number of cosponsors, I think almost 60 at this point, which basically gets into not only the issue of fair play, but something we have found in dealing with these victims. It is the recognition that after years and years of denial and secrecy, that they are being recognized as what they are, which is really patriots who put it on the line for our country. Instead of being mistreated, they are getting recognition for the good things they have done for our country, and I think that has a lot of value to it. I think it is a statement we have to make. That bill basically goes into the question of commendation, as well, and I recommend it to your attention.

It is very important to know that in the mustard gas successes that we have had so far, some individuals have really stood out and taken the leadership. These people are victims. We have one here today, Mr. Nat Schnurman from Virginia, who is going to testify. I am sure you are going to find his testimony extremely touching. It is quite a story. It is a story of some success, as well as a story of a tremendous amount of suffering and personal deprivation.

Also by circumstance today, you have a witness from my district who I am proud is here, I am sorry is here under the circumstances, Mr. Andy Frosini. Andy and Cathy have come up from the district. It is a long way to come from Florida. It is a lot colder here, everybody knows it and most people would rather be in Florida, I suspect. That is not a commercial, it is just an observation.

It is that type of dedication, I think, that shows that people are willing to go the extra mile here, and they care about this, and they are putting themselves to some inconvenience, and I am very happy that we have got people like that in the United States, because they know what they are standing up for is the right thing.

I must also compliment the Secretary of Veterans Affairs. Secretary Brown, true to his word, finally got published the new rules for the veterans' eligibility threshold requirements for the claims that are being processed. They were published in the Federal Register just last week, and that is a very big step that has been taken. It was not a step that came easily.

I also have to thank the National Academy of Sciences for the wonderful work they have given us, the basis and the background of providing the scientific evidence of what went wrong and adding an underscore to the fact that we have gone through years of denial, years of coverup, years of stonewalling, and truthfully there is no excuse for that. Now we are in the position not of rewriting history, but of examining history to make sure we don't make those mistakes again, to make sure that we do provide relief where it is properly required and fair and should be directed, and to make sure that the respect and the gratitude that is properly attended to this process is rendered.

So I thank you for all of that, and I will finish my remarks at that point with one final word in saying that, of all the things that I have been able to be part of in this institution, nothing has given me more privilege than to be able to participate in this exercise, because we see progress and relief for people, and I think that is what it is about.

[The prepared statement of Mr. Goss follows:]

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TESTIMONY BEFORE THE SUBCOMMITTEE ON ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS
FEBRUARY 2, 1994

MR. CHAIRMAN, MEMBERS OF THE SUBCOMMITTEE, I VERY MUCH APPRECIATE THE CHANCE TO COME BEFORE YOU TODAY. I APPLAUD YOUR DECISION TO OPEN TODAY'S HEARING UP TO INCLUDE DISCUSSION OF ALL SECRET GOVERNMENT TESTS, NOT JUST THOSE INVOLVING THE DEPARTMENT OF ENERGY AND RADIATION. I AGREE THAT THE GOVERNMENT HAS AN OBLIGATION TO ATTEMPT TO RIGHT THE WRONGS DONE BY ANY PAST TESTING PROGRAM.

IN THE FIVE YEARS THAT I HAVE BEEN WORKING TO BRING ABOUT JUSTICE FOR THE VICTIMS OF SECRET WORLD WAR II MUSTARD AND LEWISITE GAS TESTS ON U.S MILITARY PERSONNEL, THIS SUBCOMMITTEE HAS ALWAYS BEEN AN ISLAND OF ACTION IN THE SEA OF GOVERNMENT RED TAPE.

UNDER THE STEWARDSHIP OF THEN-CHAIRMAN BARNEY FRANK, YOUR SUBCOMMITTEE PROVIDED THE LAUNCH-PAD FOR REVOLUTIONARY CHANGES. I AM GRATIFIED THAT, AFTER NEARLY 50 YEARS OF DENIAL AND BUREAUCRATIC INACTION, THE GOVERNMENT HAS FINALLY ADMITTED ITS RESPONSIBILITY FOR CONDUCTING THESE SECRET TESTS WITHOUT THE FULL, INFORMED CONSENT OF ITS SUBJECTS AND THAT IT HAS BEGUN TO ASSIST VICTIMS SUFFERING FROM LONG-TERM HEALTH PROBLEMS.

THE FACTS ARE NO LONGER IN QUESTION: DURING WORLD WAR II, AMID FEARS OF AN ENEMY CHEMICAL ATTACK, THE UNITED STATES NAVY (AND LIKELY THE OTHER ARMED SERVICES AS WELL) EMBARKED ON A PROGRAM TO TEST THE EFFECTIVENESS OF PROTECTIVE CLOTHING AGAINST IMPREGNATION BY MUSTARD GAS AND LEWISITE. IN GATHERING THE NEEDED SUBJECTS FOR THESE TESTS, "VOLUNTEERS" WERE SOLICITED, UNDER THE GUISE OF TESTING "SUMMER CLOTHING" AND WITH THE ATTRACTIVE PROMISE OF EXTRA WEEKEND LIBERTY PASSES.

ONCE COMMITTED TO THE PROGRAM, THESE 17 AND 18-YEAR OLD TRAINEES SUDDENLY "CEASED TO BE VOLUNTEERS." THEY WERE FITTED WITH GAS MASKS AND SUITS, AND ORDERED INTO GAS CHAMBERS FOR REPEATED EXPOSURE TO LETHAL GASES. DOCUMENTATION CONFIRMS THAT THE TESTS WENT BEYOND STUDYING THE EFFECTIVENESS OF THE CLOTHING, AND MOVED INTO A STUDY OF HOW MUCH EXPOSURE A MAN COULD TAKE, THE INFAMOUS "MAN-BREAK" TEST. IN MANY CASES. THE PROTECTIVE EQUIPMENT FAILED.

WHEN THEY WERE NO LONGER NEEDED, OR WHEN THEY WERE TOO SICK TO CONTINUE, THE MEN WERE SENT BACK TO THEIR POSTS WITHOUT PROPER MEDICAL FOLLOW-UP. THEY WERE SWORN TO SECRECY AND THREATENED WITH COURTS MARTIAL IF THEY REVEALED THE TRUE NATURE OF THEIR EXPOSURE TO ANYONE, EVEN TO THEIR OWN PHYSICIANS. GIVEN THE CLASSIFIED STATUS OF THIS TEST PROGRAM, THE RECORD-KEEPING ABOUT WHO PARTICIPATED, LEVELS OF EXPOSURE AND INJURIES SUSTAINED IS WOEFULLY INCOMPLETE AND SOMETIMES NON-EXISTENT.

THIS STATIONERY PRINTED ON PAPER MADE OF RECYCLED FIBERS

AFTER DECADES OF SILENCE, THESE MEN BECAME ILL AND SOME VENTURED TO SPEAK OUT ABOUT WHAT THEIR GOVERNMENT HAD DONE TO THEM. NOT ONLY HAD THEY BEEN LIED TO, BUT THEY HAD BEEN USED AS HUMAN GUINEA PIGS AND THEN DISCARDED. WHEN THEY SOUGHT REDRESS -- AND ASSISTANCE FOR THEIR MEDICAL PROBLEMS -- THEY WERE REBUFFED. FIRST CAME THE DENIAL, THEN THE STONEWALLING, THEN THE "GEE, WE WISH WE COULD HELP, BUT . . ." ACCORDING TO VA RULES, IN ORDER TO RECEIVE COMPENSATION FOR A DISABILITY, YOU HAD TO SHOW THAT THE MEDICAL PROBLEM WAS THE RESULT OF YOUR SERVICE. IN THE CASE OF THE MUSTARD GAS VICTIMS, WHO HAD NO PAPER TRAIL FOR THEIR PLIGHT, THIS WAS PRACTICALLY IMPOSSIBLE, A TRAGIC CATCH-22.

BUT A FEW PERSISTED, AND TODAY, ONE OF THE PIONEERS IN THIS CRUSADE IS HERE WITH US. NAT SCHNURMAN REFUSED TO ACCEPT THE DENIALS. USING HIS COMPUTER, HIS TELEPHONE AND HIS FREEDOM OF INFORMATION RIGHTS AS A U.S. CITIZEN, HE GATHERED BOXES AND BOXES OF RECORDS AND WAS ABLE TO PIECE TOGETHER ENOUGH EVIDENCE TO SHOW THAT HE AND THOUSANDS OF OTHERS HAD INDEED BEEN USED AS HUMAN GUINEA PIGS.

FINALLY, AFTER NATIONAL MEDIA ATTENTION, IN 1991 THE VA BEGAN TO CHANGE THE RULES TO HELP MUSTARD GAS VICTIMS. AT THAT TIME, VA ALSO COMMISSIONED A LONG-TERM STUDY INTO HEALTH PROBLEMS ASSOCIATED WITH EXPOSURE TO LETHAL GASES. IN 1993, WITH THE RELEASE OF THAT STUDY, ENTITLED "VETERANS AT RISK," THE DEPARTMENT OF DEFENSE OFFICIALLY RELEASED ALL PARTICPANTS OF THESE TESTS FROM THEIR OATH OF SECRECY. AND, JUST LAST MONTH, THE PROPOSED NEW RULES FOR EXPANDING THE LIST OF ILLNESSES ASSOCIATED BY THE VA WITH MUSTARD GAS EXPOSURE WERE PUBLISHED IN THE FEDERAL REGISTER.

IN MY OFFICE, WE HAVE HEARD FROM HUNDREDS OF MEN AND THEIR FAMILIES FROM AROUND THE COUNTRY. THEY ALL TELL SIMILAR TALES OF LIES, DECEPTION AND BETRAYAL. THEY NEED MEDICAL HELP; THEY WANT RECOGNITION; THEY DESERVE RESPECT AND GRATITUDE.

TODAY WE KNOW THAT GOVERNMENT'S USE OF UNWITTING SUBJECTS FOR POTENTIALLY HARMFUL STUDIES WAS NOT LIMITED TO THE MILITARY IN TIMES OF ACTUAL WAR. ENERGY SECRETARY HAZEL O'LEARY HAS SAID THAT GOVERNMENT HAS AN OBLIGATION TOWARD RADIATION VICTIMS -- I AGREE. BUT I THINK GOVERNMENT HAS AN OBLIGATION TOWARD ALL VICTIMS OF SECRET TESTS.

THANK YOU FOR YOUR PATIENCE AND YOUR INTEREST.

Mr. BRYANT. Thank you very much, Mr. Goss.

Our final witness from the Congress is Congresswoman Leslie Byrne who brings to us today a third part of this whole inquiry, that is to say the testing of American citizens with LSD. Congresswoman Byrne has brought to the committee one of her own constituents, Lloyd Gamble, who is going to explain, or rather testify with regard to that area. We are pleased to have her here today and we also acknowledge your legislation with regard to Mr. Gamble that is pending before this committee.

STATEMENT OF HON. LESLIE BYRNE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF VIRGINIA

Ms. BYRNE. Thank you, Mr. Chairman, and members of the committee.

I would also like to add my thanks for holding this hearing about the much publicized practice of Government experimentation on humans. Mr. Lloyd Gamble, who a constituent of mine, lives in Fairfax, VA, and was one of these unsuspecting victims who received LSD. Mr. Gamble came to my office last year and told me the story that you will hear shortly, and I believe his story speaks for itself.

In spite of the recent attention in the news to these human experiments, this is not news to people like Mr. Gamble. What we have not realized is that for over 20 years, people like Mr. Gamble have known about these experiments, as has the Government. Mr. Gamble and the other victims of LSD experimentation cannot be left by the wayside.

They have legitimate claims. These people have been wronged by the Federal Government and they should be compensated. I urge you to include these claims in an overall effort to compensate the victims of human experimentation. I also urge you to act on the legislation that I introduced, H.R. 3344, that will compensate Mr. Gamble for lost pay and mental anguish due to the harm caused by Government acts.

As you might recall, this subcommittee reported out a similar bill in the 102d Congress and it passed the House by unanimous vote. Unfortunately, the Senate recessed before it could take action on Mr. Gamble's compensation. Just one more unfairness that Mr. Gamble has faced.

Today we will revisit the issue. Gentlemen, the committee's sympathy and kind words will only go so far in acknowledging what happened to Mr. Gamble, and I think we all agree it was morally repugnant. It is now time for action.

Mr. Gamble has tried to resolve this problem through the court system. They did not hear his claim. This Congress is now his last resort. And I urge you to match rhetoric with action by expediting the consideration of H.R. 3344 in giving Mr. Gamble the compensation that he rightly deserves.

Compensating Mr. Gamble for lost pay and mental duress will not bring back the lost time of his life when he suffered from inexplicable periods of deep depression, severe personality disorders with periodic blackouts, suicidal urges and violent behavior. But it is the least we can do to address these wrongs.

Again, Mr. Chairman, I want to thank you for holding these hearings and giving me the opportunity to introduce Mr. Gamble along with the rest of the next panel.

[The prepared statement of Ms. Byrne follows:]

TESTIMONY OF REP. LESLIE L. BYRNE
BEFORE THE JUDICIARY SUBCOMMITTEE ON ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS
FEBRUARY 2, 1994

Mr. Chairman, I would like to thank you for holding this hearing about the now much-publicized practice of government experimentation on human subjects. Mr. Lloyd Gamble, a constituent of mine who lives in Fairfax, Virginia, was one of these unsuspecting victims that received LSD.

Mr. Gamble came to my office last year and explained to me the story you will hear shortly. His story speaks for itself. In spite of the recent attention in the news to these human experiments, this is not news to people like Mr. Gamble. What we have not realized is that for over twenty years, these people have known about these experiments. Mr. Gamble and these other victims of LSD experimentation cannot be left by the wayside. They have legitimate claims. These people have been wronged by the federal government and they should all be compensated.

I urge you to include these claims in an overall effort to compensate the victims of human experimentation. I urge you to act on legislation that I introduced, H.R. 3344, that will compensate Mr. Gamble for lost pay and mental anguish due to the harm caused by official government acts. As you might recall, this subcommittee reported out a similar bill favorably in the 102nd Congress and it passed the House by a unanimous vote. Unfortunately, the Senate recessed before it could take action on Mr. Gamble's compensation.

Today, we will revisit the issue. Rhetoric and kind words will only go so far in acknowledging that what happened to Mr. Gamble was morally repugnant. It is now time for action. Mr. Gamble has tried to resolve this problem through the court system. They did not hear his claim. This Congress is now his last resort. I urge you to match your rhetoric with action by expediting consideration of H.R. 3344 and giving Mr. Gamble the compensation he rightly deserves.

Compensating Mr. Gamble for lost pay and mental duress will not bring back the lost time of his life when he suffered unexplainable periods of deep depression, severe personality disorders with periodic blackouts, suicidal urges and violent behavior. But it is the least we can do.

Mr. BRYANT. Thank you very much.

The Chair recognizes himself for a first round of questions of five minutes in length.

Mr. Markey, when you first found or heard of this activity and began to study it, I am sure you began to ask questions, and I am curious to know, and I think it is helpful for us to understand in our own Government, how it works when faced with this. I am sure you are asking people who worked within the Energy Department or other departments of the Government a very long time after these experiments took place and who bore no personal responsibility for it, is that correct?

Mr. MARKEY. That is correct.

Mr. BRYANT. Why, in your opinion, were they reticent to discuss a history that really was not of their own making?

Mr. MARKEY. Well, I think, to be honest with you, that the country, as long as the cold war continued, labored under the misimpression that the release of any secrets that had been in fact accumulated during the course of the cold war would undermine efforts to end the cold war. And so as a result, any bit of information that leaked out about inappropriate conduct would, in the minds of those who worked at the agencies at that time, even in the 1980s, undermine a certain code of secrecy that had enshrouded the agencies.

So whether it be the nuclear testing that Secretary O'Leary has now been more honest about, whether it be the harm done to workers at nuclear weapons facilities, or whether it be these victims that were experimented upon, even though there was no real justification for keeping it secret any longer since it had occurred 20 and 30 years in the past, still there was this sense that it should be kept secret.

But also understand that there were still many within the bureaucracy who had a stake in this secrecy, who were part of the hubris of the age, who believed that the nuclear scientists, the nuclear priesthood could do no wrong, and as a result, the combination of those factors made it difficult, impossible in fact, even in 1986, for us to confront the reality of what we had done to our own citizens in the name of national security. But once the cold war had ended and a new Secretary of Energy had come forward, one, by the way, not a part of the national security infrastructure—remember, most DOE secretaries came out of the security history of our country, from James Schlesinger with Jimmy Carter at DOE, right through the 1980's, there was a real sense that the DOE was just—well, an attic for the DOD, and it would do what needed to be done in the development of nuclear weapons. Well, that era has now ended, and it is now possible for Democrat and Republican, liberal and conservative to look back at that era and to make this information public.

Mr. BRYANT. Thank you. Mr. Frost, your legislation provides compensation and basically relieves the victim of the need to prove damages. I am curious to know to what extent your legislation would require payment to the families of the deceased.

In other words, how many generations are we going to go backward in providing compensation?

Mr. FROST. Well, the legislation, Mr. Chairman, specifically sets out the definitions, and it would go up two generations, back two generations, so that it could go as far as a grandparent or a grandchild. It would not go beyond that.

Mr. BRYANT. I have no further questions.

The gentleman from Pennsylvania.

Mr. GEKAS. Yes; I thank the Chair. I saw briefly just a moment ago the prepared testimony of Representative Goss. Porter, you actually were talking about the same kind of thing I said in my opening remarks about the gas test, the gas masks. I am shocked that I am in the purview of reality in this problem.

Mr. FRANK. Don't give us openings like that.

Mr. GEKAS. At any rate, I want to be one of the first claimants when this comes about. But here we are talking specifically about mustard gas, is that correct, Porter?

Mr. GOSS. Mr. Gekas, it is mustard gas and lewisite gas testing and there may be more involved to it than that. That was the main focal point given most of the symptoms in most of the victims. It was those tests that we were focusing on, but since this is a broad hearing on types of unwitting testing it is by no means a locked up parameter.

Mr. GEKAS. Just one general question. I have not seen the Frost bill yet, but I am going to be very much interested as this develops as to what standards we are going to apply and what definitional language we are going to apply to the phrase "informed consent." That has—is an important part in all of this, because if indeed some of the programs were conducted under fully informed consent, written and without question as to the volunteer aspects of the program, then we have to cast a different light on it from those programs in which there were human guinea pigs who knew nothing about what was happening.

Representative Frost, do you have some comment?

Mr. FROST. Well, there is a—in the statute that I have drafted, there is a definition of informed consent. The term "informed consent" means consent by the individual or the individual's parent or a legal guardian, in the case of an individual who was a minor or was incompetent at the relevant time, to the individual's participation in an experiment after a full disclosure of the nature and purpose of the experiment and its possible consequences that was sufficient to allow the individual—and I am skipping here a little bit—to intelligently exercise judgment to decide whether the individual should participate in the experiment. I have tried to carefully define "informed consent."

But you are correct, you raise a legitimate question, and it is something that if this committee seriously pursues the issue of compensation, you have to look at what happens in those instances when there clearly was informed consent. And my legislation only goes to those instances where there was not informed consent.

Mr. GEKAS. Yes. To that extent, we would want to use a definition like the one you just articulated as a threshold for the process of determining such a definition. May I ask from where that was drawn, because it sounds like it was drawn from some other facet of legislation.

Mr. FROST. Well, much of the legislation was drawn, much of what appears in my legislation was drawn from the 1990 legislation originated by this committee.

Mr. GEKAS. That is what I thought.

Mr. MARKEY. May I just respond to that?

At the Fernald School for the Retarded in Massachusetts there was a consent form that was signed by parents or guardians for young boys who had been diagnosed as being mentally retarded to participate in a program in which radioactive iron and radioactive calcium would be fed to the boys with their breakfast.

Now, the letter, however, although it was signed by the parents is very deceptive, because the letter just says that we want to feed your boys an enriched diet of iron and calcium, never mentioning the word "radioactive," as well as saying the experiment could lead to an improvement in the health of the boys and that those boys who were selected were considered to be the brightest of the boys and would be rewarded for their participation.

This was a letter put together by MIT in conjunction with the Fernald School for the Retarded asking for the parents' consent. The parents signed, of course, thinking that their child would be benefited. So I think we have to look back at what was used as a definition of consent in that time, and really determine whether or not there was informed consent given by parents in many of these instances.

Mr. GEKAS. Exactly. You are implying that your interpretation of the informed consent, even the one now before us, would not have covered that situation. You are drawing the conclusion that it was not really informed consent.

Mr. MARKEY. In essence, they were lying to the parents and I don't think at any point in time was there any exception that any doctor or any scientific code gave for lying to those who were experimented on.

Mr. FROST. And that situation would not satisfy the definition of "informed consent" in my legislation.

Mr. GEKAS. Right. Deliberate misleading or lying takes it out of the purview of that definition, of course.

I have no further questions.

Mr. BRYANT. Thank you. The gentleman from Ohio.

Mr. MANN. I have no questions.

Mr. BRYANT. OK. The gentleman from North Carolina.

Mr. WATT. Thank you, Mr. Chairman.

I just have one question of Mr. Markey. It seems to me that the thrust of your recommendations on page 3 address one aspect of the harm that is being done, which is the actual physical harm or injury that is done to somebody who participated without consent in these experiments. But it seems to me that there is another side of that that—of the harm that I am not sure is addressed by any of the three recommendations you have made here. And that is the abhorrence that we should all feel that our Government acted like it is bigger than the individuals that constitute our Nation, if you will, that acted as if it were a Communist nation itself by being the big brother and conducting these experiments in the first place.

I don't see anything in here in the compensation section that would tend to deter this kind of activity in the future. You can compensate folks, but unless there is some kind of punitive damages or something that deters this kind of conduct, I am not sure the second harm is addressed. Did you intend that, or is there——

Mr. MARKEY. No.

Mr. WATT. Is there something implicit in these words here that I don't see?

Mr. MARKEY. Well, first of all, on page 4 of my testimony I make reference to the fact that even for those who were not physically harmed, but were experimented upon, that some form of compensation should be considered by this subcommittee to deal with the "dignity injury" that may have been inflicted upon people, and I don't know what form that compensation should take. But I do believe that full consideration should be given to that subject.

In addition, Senator Kennedy and I are working on a piece of legislation that will deal with a comprehensive review of the ethical standards that are used by our Government in dealing with their own citizens. And I think that your point is right on the money, that we have to make sure that it never happens again.

Now, each agency chief is now giving commitments that it does not occur today. Our job has to be to ensure that it will never happen again. And I think legislation should be passed that brings a modern, up-to-date code of conduct that each Federal agency has to abide by, and put it on the books and do so this year. And I think the time is right, and I think you put your finger right on the problem, that future generations should never have to confront.

Mr. WATT. You then do anticipate that actual legislation you propose will provide such a deterrent?

Mr. MARKEY. Yes. Senator Kennedy has already announced that he is going to propose legislation; we have already begun hearings. The Fernald School for the Retarded was the site of the first hearing on this subject, but comprehensive legislation will be forthcoming to deal with this subject and to ensure that there is a code that our Government abides by.

Mr. WATT. Do I read properly, Mr. Frost, and Mr. Goss, that your legislation does have implicit in it something that addresses the concern I have expressed?

Mr. FROST. Mr. Watt, my legislation specifically includes an apology by the Federal Government to the families and the individuals, similar to what was included in the legislation that compensated the Japanese-Americans who were interned during World War II. It does not, at this point, specifically include provisions that you were suggesting about prospectively preventing our Government from ever doing this again, and I think you make a valid point in that whatever legislation that is ultimately produced by this subcommittee should include something of that nature.

Mr. WATT. Does it provide any compensation for those who could not prove physical injury, but——

Mr. FROST. The answer is yes, that they are harmed, per se, and the difference from previous legislation—previous legislation required one of a certain form of cancer to have been proved. This establishes the fact that they were experimented on at all, it establishes harm and permits them to apply for the compensation.

Mr. WATT. Mr. Goss.

Mr. GOSS. The situation with regard to the mustard gas testing victims was extraordinary in the sense that not only were they victims, they were sworn to secrecy and threatened with serious consequences if they violated that secrecy. So consequently we lost the trail of the medical possibilities of going back in the files and finding out whether they were subjected to what, and how much of what and when and all that type of information.

So we have three problems. We have finding the files and finding out what kind of medical attention we can get from them; the question of, is there some relief available, and there is the Department of Veterans Affairs, which has just published new rules in the Federal Register, which should make that a lot easier. And then there is a last question which is open, which is in the area of my bill which is a commendation question.

All of these things aim at the victims. The underlying legislation aims at the "we don't do this in the United States of America, testing on unwitting human victims." That is not what this is about in this country. So I think the answer to your question is, yes, in all of our instances.

Mr. WATT. Ms. Byrne, I have not addressed that question to you because I know you are dealing with a specific case where there is a specific injury, but I don't mean to imply any lesser concern about those cases. I just wanted to make sure that we got the concern on the other side.

Thank you, Mr. Chairman.

Mr. BRYANT. Mr. Frank of Massachusetts.

Mr. FRANK. Mr. Chairman, I want to begin with my expression of admiration for Secretary O'Leary. I sat where you sat for a few years and one of the frustrations was the, to me, incomprehensible reflex of people then in power to defend absolute outrageous acts committed by their predecessors of 10 and 15 and 20 years ago. I don't know whether there was something in the walls that leapt out and grabbed these people, because there was a sense of institutional—even beyond loyalty—refusal to acknowledge error, which was very discouraging.

People have talked about the Radiation Exposure Compensation Act and the limitations that dealt with the downwind. It certainly was broadly written, this was certainly in the interest of Stu Udall who really quite forcefully crusaded for it. Senator Orrin Hatch was a big supporter, but we ran into obstacles in the administration that said they wouldn't sign it.

It is a great relief to have a situation in which administration officials are cooperating with us in this. There was just a stonewalling that was based on the mistaken view that if you are today the head of a department which once did something wrong, that somehow your institutional responsibility was to defend that error to the end.

That was so powerful an institutional response that I am delighted to see, and I think Secretary O'Leary paved the way. And I hope people will recognize that she got up and said: You know what, people, before I got here, my department screwed up. And nothing bad happened. I hope she has banished a taboo in this town, which says that it is OK to get up and say, boy, this was badly done, this was wrong. Not that everybody who did it was a terrible person; we know that there were different standards that people were living for then. But I hope that she will be following that motto.

Second, let me just say—because I think Mr. Watt's question was a very good one—I wouldn't underestimate, and I am not suggesting anyone did in terms of the psychiatric harm that was done to people, the value of the apology that that is a part of it. If you haven't talked to some of the Japanese Americans, now people obviously in their fifties and sixties, most of them, because we are talking about events of 50 years ago, but talk to those who received a letter from the President of the United States saying I apologize, this country mistreated you. And I found that that letter of apology from the President of the United States which is part of the legislation that was passed was, in fact, a powerful tonic for many people.

Our colleagues, Mr. Matsui and Mr. Mineta, who were both interned themselves, received letters and they can both testify to that. So I think that very much ought to be included, that letter of apology signed by the President on behalf of the country, and the legislation itself include the phrase "on behalf of the Nation, Congress apologizes." And I think communicating that to people is very important. I think this is an excellent moment for our country.

People make errors and government make errors. But a willingness openly to acknowledge error and to do whatever is humanly possible to undo those effects I think this is one of our finest moments.

And I think the gentleman from North Carolina was right, this is a time when you talk about what government ought to be and what government ought to do, and I don't think a government ever fulfills better its responsibilities than when it admits mistakes and does what it can to undo them. So I hope we will go forward with this.

Mr. BRYANT. Thank you. Well said. The Chair would like to identify himself with those same comments.

We thank the Members of Congress for testifying here today and for your courage and foresight in the past. Thank you very much.

At this time we would invite our second panel forward, which includes Mr. Lloyd Gamble, LSD test subject; Mr. Andrew Frosini, a radiation test subject; and Mr. Nathan Schnurman, a mustard gas test subject. We thank each of you for being here.

We would ask you to keep your statement to 5 minutes in order that we might have plenty of time to ask questions.

And the Chair will first invite Mr. Lloyd Gamble to begin his testimony. Thank you for being here.

STATEMENT OF LLOYD B. GAMBLE, SERGEANT, U.S. AIR FORCE, RETIRED

Mr. GAMBLE. Mr. Chairman, members of the committee——

Mr. BRYANT. If you would pull the microphone close to you, it would assist us.

Mr. GAMBLE. My name is Lloyd Gamble, sergeant, U.S. Air Force, retired. I am also retired from the Capitol Police. I am 65-years-old and I have given 35 years of service to my country, either in military or in law enforcement. I would like to tell you what happened and what I received in turn.

I enlisted in the U.S. Army in 1944 and was transferred to the Air Force in 1950. I was career-oriented, a highly motivated, noncommissioned officer. I was steadily promoted. My periodic fitness reports assured continued promotions. But most importantly, serving my country in the Air Force went beyond duty. It was my, and my family's, life.

But in 1968, dismayed and disheartened, I took an early retirement. Instead of staying 30 years, I elected to get out in 20. I had been humiliated by being moved from a job as a top-rated air police investigator and was given a meaningless job as a desk clerk. For a time my security clearance was pulled and I was barred from carrying a side arm as an air policeman. And despite the fact that my immediate supervisors continued to give me the highest fitness ratings and recommendations, I received only one promotion in 10 years.

In the summer of 1957, while I was stationed at Dover Air Force Base, a Department of Army memorandum was circulated throughout all branches of the military. The subject was a medical research volunteer program being conducted by the Army Chemical Corps at Edgewood Arsenal in Maryland. From as high up as the Secretary of the Army, Mr. Brucker, the program was described as being in the highest national security interests at the time when the cold war was at one of its most tense periods.

Incentives, including liberal leave, family visitation, and the finest of living and recreation facilities were offered. But most important to a young career-oriented NCO, volunteering for the program would be given official recognition through letters of commendation and certificate of participation. I discussed the program with my commanding officer and decided to volunteer. I was accepted and sent TDY to Edgewood Arsenal.

This is what I was told. I would be testing protective equipment such as gas masks and coverall clothing while being exposed to, quote, certain toxic agents, which would be, quote, inhaled in very small amounts. I was further told that I would be thoroughly informed about all of the test procedures and what I could expect—I was thoroughly informed about all test procedures and what can be expected prior to each test.

Having understood this, I was required to sign what was called a volunteer's participation agreement which stated in part, the experiments will be conducted as to avoid all unnecessary physical and mental suffering and injury, and I will be at liberty to request that the experiments be terminated at any time.

That is what I was told. This is what happened. I was never asked to inhale a small amount of certain toxic agents. Instead, two or three times I was asked to drink a glass of clear, odorless, tasteless liquid. And how was I thoroughly informed about this test?

I was told that the effects would be similar to that of having one or two highballs. And then I was given a massive dose of LSD, one of the most potentially dangerous hallucinogenic drugs then known to medical science, LSD, a compound which causes psychotic symptoms similar to those of a schizophrenia.

After the end of my participation in the program, I was left to twist slowly into the wind, with no followup medical or psychiatric help as my personal and professional life began to disintegrate to the point that I would begin to doubt my own sanity. Consider this: While at Edgewood, I was ordered to Dover Air Force Base to testify at a trial, and I have no memory of leaving Edgewood, nor do I remember testifying or returning back to Edgewood. So they had no idea what they were testing and the dangers of driving under the influence of LSD.

I began experiencing periods of deep depression and erratic behavior, and more and more withdrawal from my family and my closest friends and military friends. At one point, divorce from my beloved wife of 39 years was a very real possibility. And then late one night a passing motorist pulled me back from a railing on the Key Bridge, stopped my suicide attempt, which of course led to my confinement at that time at Andrews Air Force Base in the psychiatric ward.

Then, as suddenly as the active schizophrenia began, they ceased. Gradually I was able to put my personal life back together. The Department of Defense and Justice have been quick to argue at every opportunity, as I have sought redress. After my retirement from the Air Force, I went on to have a distinguished career in law enforcement.

But for many years my family and I were left in anguish to wonder what happened to us. Could it happen again? There were people in the U.S. Government at the time who had all the answers, but they weren't talking.

When I finally learned in 1975 what happened to me, what had been done to me at the hands of my Government, I had sworn to protect and serve with my life if need be, there was bitterness.

That bitterness increased when the Department of the Army initially denied even that I had been an LSD guinea pig. That is until I furnished an official publicity photo of me at Edgewood Arsenal, one of the valiant servicemen volunteering for the program that was in the highest national security interests.

Eventually I began to learn that I was not alone; that many of my fellow Americans had endured equal and more suffering than my family and I had. And I suppose that is really why I am here today.

I have no way of knowing what the outcome of these hearings, or subsequent congressional actions will be. But God bless you for listening to us today. And please keep your determination and resolve these terrible things so they will never happen again.

Thank you for hearing my story.

[The prepared statement of Mr. Gamble follows:]

TESTIMONY OF LLOYD B. GAMBLE
BEFORE THE JUDICIARY COMMITTEE
ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS SUBCOMMITTEE
FEBRUARY 2, 1994

Good morning, and thank you for the opportunity to appear hear today. My name is Lloyd B. Gamble, Sergeant, USAF, Retired. I am also a retired Capitol Hill police officer. Today I am 65 years old. I have give 35 of those years in service to my country--either in the military or in law enforcement. I would like to tell you what I received in turn.

I enlisted in the U.S. Army in 1944 and then transferred to the U.S. Air Force in 1950. I was a career oriented, highly motivated non-commissioned officer. I was steadily promoted. My periodic fitness reports assured continued promotions. But most importantly, serving my country in the Air Force went beyond duty. It was my--and my family's--life.

But in 1968, dismayed and disheartened, I took an early retirement. In the previous ten years, I had been humiliated by being moved from my job as a top-rated Air Police investigator and given meaningless desk jobs. For a time my security clearance was questioned and I was barred from carrying a sidearm. And despite the fact that my immediate superiors continued to give me the highest fitness ratings and recommendations, I received only one promotion. One stripe in more than 10 years.

My career, I finally realized was finished. It was not until 1975 that I learned why. And that is why I am here today.

In the summer of 1957, while I was stationed at Dover AFB, a Department of the Army memorandum was circulated throughout all branches of the military. The subject was a "Medical Research Volunteer Program" being conducted by the Army Chemical Corps at Edgewood Arsenal, MD. From as high up as the then-Secretary of the Army Brucker, the program was described as being in the "highest national security interests" at a time when the Cold War was at one of its most tense periods.

Incentives--including liberal leave policy, family visitations and the finest in living and recreation facilities--were offered. But most important to a young, career-oriented NCO: Volunteering for the program would be given "official recognition through letters of commendation and certificate of participation." I discussed the program with my CO, decided to volunteer, was accepted and TDY'd to Edgewood Arsenal.

This is what I was told. I would be testing protective equipment such as gas masks and coverall clothing while being exposed to--quote--"certain toxic agents" which would be--quote--"inhaled in very small amounts." I was further told that I would be--quote-thoroughly informed about all test procedures and what can be expected prior to each test."

Having understood this, I was required to sign what was called a Volunteer's Participation Agreement which stated in part--quote: "The experiments will be conducted as to avoid all unnecessary physical and mental suffering and injury, and I will be at liberty to request that the experiments be terminated at any time."

That is what I was told. This is what happened.

I was never asked to inhale very small amounts of certain toxic agents. Instead, on two--perhaps three--occasions I was asked to drink a glass of a clear, odorless, tasteless liquid. And how was I "Thoroughly informed" about the test? I was told that the transitory effects would be similar to having one or two highballs. And then I was given a massive dose of LSD--one of the most virulent and potentially dangerous hallucinogens then known to medical science.

LSD--"A compound which causes psychotic symptoms similar to those of schizophrenia."

After the end of my participation in the program, I was left to twist slowly in the wind--with no follow-up medical or psychiatric help--as my personal and professional life began to disintegrate to the point I would begin to doubt my own sanity. Consider this.

- While at Edgewood, I was ordered to Dover AFB to testify at a court martial hearing. I have no memory of that trip, and it was not until I read the official transcript that I finally believed I had been there.

- While stationed in Tripoli, I came to my senses being physically wrestled to the ground and restrained by fellow soldiers. I had suddenly "gone berserk, crazy," they told me. The "official" report found I was drunk, but at the time and under the circumstances there was no way I could have been.

- I began experiencing periods of deep depression and erratic behavior--and more and more withdrawal from my family and closest civilian and military friends. At one point, divorce from my beloved wife of 39 years was a very real possibility.

- And then one late, late night, only a passing motorist who pulled me back off the railing on Key Bridge stopped my suicide attempt--which of course then led to my confinement for psychiatric evaluation.

Then, as suddenly as the active symptoms of schizophrenia began, they ceased. Gradually, I was able to put my personal life back together and--yet, as the Departments of Defense and Justice have been quick to argue at every opportunity as I have sought redress--after my retirement from the Air Force, I went on to have a distinguished career in law enforcement.

But for too many years my family and I were left in anguish to wonder: What happened to us? Could it happen again? There were people in the United States government at the time who had all the answers--but they weren't talking.

When I finally learned in 1975 what had happened to me--what had been done to me at the hands of the government I had sworn to preserve and protect, with my life if need be--there was bitterness.

That bitterness increased when the Department of the Army initially tried to deny even that I had been an LSD guinea pig. That is until they were furnished an official DOD publicity photo of me at Edgewood Arsenal--one of the valiant servicemen volunteering for a program that was in the highest national security interests.

But eventually I began to learn that I was not alone. That many of my fellow Americans had endured equal or more suffering than my family and I had. And, I suppose, that is really why I am here today.

Faced with revelations of some foreign government's heinous actions, we comfort ourselves here in America with the belief, "It can't happen here." But it did. The covert LSD experiments, the radiation experiments. All of them using human beings--many of them military personnel, or physically, or emotionally, or economically disadvantaged civilians--as unknowing guinea pigs.

I have no way of knowing what the outcome of these hearings--and any subsequent congressional action--will be. But God bless you for listening to us. today. And please, keep your determination and resolve to see that these terrible things will never again happen here.

Thank you for hearing my story.

SUMMARY OF TESTIMONY
LLOYD B. GAMBLE
HOUSE JUDICIARY COMMITTEE
ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS SUBCOMMITTEE
FEBRUARY 2, 1994

1. Enlisted in the U.S. Air Force in 1950
2. In 1957, volunteered for a special program to test new military protective clothing.
3. In three weeks was given 2 or 3 massive doses (water glass size) of LSD.
4. Thereafter, experienced erratic behavior for a number of years, and does not now know when such behavior might return.
    a. Tried to jump off Key Bridge but was saved by a passerby.
    b. Detained at Malcom Growe General Hospital at Andrews Air Force Base.
    c Lost his clearance and was relegated to "desk work".
5. Volunteered for two tours of duty in Viet Nam.
6. In the eleven years after 1957, he was promoted one time, whereas in the prior nine years he had been promoted five times.
7. Was never told by the military what happened to him at Edgewood.
8. Learned what had happened to him at Edgewood in 1975 as a result of Congressional hearings.
9. In 1975 the Department of Defense denied Lloyd was at Edgewood in December, 1957.
10. The Department of Defense has now admitted Lloyd had participated in LSD testing at Edgewood, Maryland

Mr. BRYANT. Thank you very much, Mr. Gamble, for coming here today. We will have questions for you in a moment.

At this time we would call Mr. Andrew Frosini.

STATEMENT OF ANDREW E. FROSINI, U.S. ARMY AIR FORCE CADET, WORLD WAR II

Mr. FROSINI. My name is Andrew Frosini and I am a resident of Fort Myers, FL. I served as a U.S. Army Air Force cadet during World War II. I would like to express my appreciation to the committee for inviting me to appear here today and give testimony as to my experience some 49 years ago.

While serving as an air combat crewman at Drew Field in Tampa, FL, I was subjected by the military to involuntary testing with irradiation therapy.

To provide you with a perspective of time, I was then 20 years old, having returned from combat duty assignment in the European Theater of Operations. In June 1945, I returned to the United States and I was given a routine physical examination which certified me for continuation of flight status by the flight surgeon at Drew Field. I had expressed no complaints and had experienced no fever or infections of any kind. I considered myself to be in excellent health. I was maintained on flight status continuously throughout this entire period to the point of discharge on October 25, 1945.

While serving at Drew Field I was ordered to undergo a series of three irradiation treatments that were administered during August and September 1945. I was given no reason for the series of three treatments and there was no consent asked of me, and none was given either by expressed or implied consent.

The fact that these treatments took place is evidenced by original copies of my records that I have retained in my possession. Photocopies of these are being provided as exhibits to this statement. I want to characterize for you the circumstances surrounding those events as having occurred during a period of wartime, within an environment of strict discipline. It was never acceptable to question any military order.

I want to emphasize that prior to receiving the irradiation treatments, I had experienced no symptoms of sickness and had made no complaints regarding my health. Also, I was not informed as to the purpose of the treatments. Furthermore, I am unaware if there was ever any therapeutic followup after the irradiation treatments that were given in 1945.

The only health issue that arose during my military service period from July 1943 through October 1945 was the result of a minor back injury, which was documented in my record. To wit: On November 20, 1944, the aircraft to which I was assigned suffered extensive damage from enemy anti-aircraft fire while on a bombing raid over Bleckhammer, Germany. I was struck in the back by a piece of flak. The entire crew bailed out and I returned safely to my home base of operations and resumed regular combat status of active flight duty. Of course, I had a sore back for a few days, but felt so glad and lucky that we had avoided capture, the back injury was soon forgotten.

Within a year after discharge from active duty, I began to experience back pains and filed a claim with the Veterans' Administration. By cursory examination, the VA doctor found no disability and the claim was denied.

Shortly after that, and also within that first year after discharge, I developed sinus allergies and went to a private doctor for treatment. Despite continuous treatment, this allergy problem has worsened over the past 49 years.

During those postmilitary years, from 1945 to 1969, I was able to operate a successful family restaurant business in Rochester, NY. Through all of those years, I have wondered if perhaps the irradiation doses given to me in 1945 could have been the source of my allergy problems.

In 1969, when I was 45 years old, I suffered a major heart attack for which I was hospitalized at the University of Rochester, NY, Genessee Hospital campus. Following this, I was pronounced permanently and totally disabled. Since 1969, I have been unable to work and earn any money. I did not feel that filing another claim with the VA would be any different than was my earlier experience.

In recent years, I have suffered the second and third heart attacks requiring hospitalization and convalescence. I have also developed severe arthritis, diabetes, and suffered a stroke. These physical problems have all required expensive medical treatment and costly prescription medications in addition to a debilitated lifestyle.

The recent change in government policy, as announced by Secretary of Energy, Hazel O'Leary, revealed there was government-approved irradiation testing performed on human subjects. I do not know if any of the other cases that have been identified thus far in any way resemble my experience, but I would like to know.

I have kept my original document copies of my records as evidence that it happened. I hope you can see that over the past 49 years I have had strong reason to wonder if I had been unwittingly used as a human guinea pig in 1945.

I have learned that an executive order was signed by President Clinton calling for the appointment of a special advisory committee to work with the Department of Energy to investigate these early experimentations with radiation. I am told that appointments to this advisory group will be selected from government physicians and other professional experts in the field of radiation. I hope that you will insist that some of the appointees to that advisory group must include subjects that were illegally tested.

If it is determined that the subjects used in the irradiation studies are justly entitled to be compensated for losses that were caused by this involuntary testing, I ask that the issues be redressed quickly. At a minimum, I think we all deserve a formal apology from our Government.

Thank you.

Mr. BRYANT. Thank you, Mr. Frosini.

[The prepared statement of Mr. Frosini follows:]

TESTIMONY OF ANDREW E. FROSINI BEFORE
HOUSE JUDICIARY COMMITTEE
SUBCOMMITTEE ON ADMINISTRATIVE AND GOVERNMENT RELATIONS
UNITED STATES HOUSE OF REPRESENTATIVES

FEBRUARY 2, 1994

MY NAME IS ANDREW E. FROSINI AND I AM A RESIDENT OF FORT MYERS, FLORIDA. I SERVED AS A U S ARMY AIR FORCE CADET DURING WORLD WAR II.

I WOULD LIKE TO EXPRESS MY APPRECIATION TO THE SUBCOMMITTEE FOR INVITING ME TO APPEAR HERE TODAY AND GIVE TESTIMONY AS TO MY EXPERIENCE SOME FORTY-NINE YEARS AGO. WHILE SERVING AS AN AIR COMBAT CREWMAN AT DREW FIELD IN TAMPA, FLORIDA, I WAS SUBJECTED BY THE MILITARY TO INVOLUNTARY TESTING WITH IRRADIATION THERAPY.

TO PROVIDE YOU WITH A PERSPECTIVE OF TIME, I WAS THEN TWENTY YEARS OLD- HAVING RETURNED FROM COMBAT DUTY ASSIGNMENT IN THE EUROPEAN THEATER OF OPERATIONS. IN JUNE OF 1945, I RETURNED TO THE UNITED STATES, AND I WAS GIVEN A ROUTINE PHYSICAL EXAMINATION WHICH CERTIFIED ME FOR CONTINUATION OF FLIGHT STATUS, BY THE FLIGHT SURGEON AT DREW FIELD. I HAD EXPRESSED NO COMPLAINTS AND HAD EXPERIENCED NO FEVER OR INFECTIONS OF ANY KIND. I CONSIDERED MYSELF TO BE IN EXCELLENT HEALTH. I WAS MAINTAINED ON FLIGHT STATUS CONTINUOUSLY THROUGH OUT THIS ENTIRE PERIOD TO THE POINT OF

DISCHARGE ON OCTOBER 25, 1945.

WHILE SERVING AT DREW FIELD, I WAS ORDERED TO UNDERGO A SERIES OF THREE IRRADIATION TREATMENTS THAT WERE ADMINISTERED DURING AUGUST AND SEPTEMBER OF 1945. I WAS GIVEN NO REASON FOR THE SERIES OF THREE TREATMENTS AND THERE WAS NO CONSENT ASKED OF ME, AND NONE WAS GIVEN EITHER BY EXPRESSED OR IMPLIED CONSENT.

THE FACT THAT THESE TREATMENTS TOOK PLACE IS EVIDENCED BY ORIGINAL COPIES OF MY RECORDS THAT I HAVE RETAINED IN MY POSSESSION. PHOTOCOPIES OF THESE ARE BEING PROVIDED AS EXHIBITS TO THIS STATEMENT. I WANT TO CHARACTERIZE FOR YOU THE CIRCUMSTANCES SURROUNDING THOSE EVENTS AS HAVING OCCURRED DURING A PERIOD OF WARTIME, WITHIN AN ENVIRONMENT OF STRICT DISCIPLINE. IT WAS NEVER ACCEPTABLE TO QUESTION ANY MILITARY ORDER.

I WANT TO EMPHASIZE THAT PRIOR TO RECEIVING THE IRRADIATION TREATMENTS, I HAD EXPERIENCED NO SYMPTOMS OF SICKNESS, AND HAD MADE NO COMPLAINTS REGARDING MY HEALTH. ALSO, I WAS NOT INFORMED AS TO THE PURPOSE OF THE TREATMENTS. FURTHERMORE, I AM UNAWARE IF THERE WAS EVER ANY THERAPUTIC FOLLOW-UP AFTER THE IRRADIATION TREATMENTS THAT WERE GIVEN IN 1945.

THE ONLY HEALTH ISSUE THAT AROSE DURING MY MILITARY SERVICE PERIOD FROM JULY 1943 THROUGH OCTOBER 1945, WAS THE RESULT OF A MINOR BACK INJURY, WHICH WAS DOCUMENTED IN MY RECORD. TO WIT: ON NOVEMBER 20, 1944 THE AIRCRAFT TO WHICH I WAS ASSIGNED SUFFERED EXTENSIVE DAMAGE FROM ENEMY ANTI-AIRCRAFT FIRE WHILE ON A BOMBING RAID OVER BLECKHAMMER, GERMANY. I WAS STRUCK IN THE BACK BY A PIECE OF FLAK. THE ENTIRE CREW BAILED-OUT AND I RETURNED SAFELY TO MY HOME BASE OF OPERATIONS AND RESUMED REGULAR COMBAT STATUS OF ACTIVE FLIGHT DUTY. OF COURSE, I HAD A SORE BACK FOR A FEW DAYS, BUT FELT SO GLAD AND LUCKY THAT WE HAD AVOIDED CAPTURE, THE BACK INJURY WAS SOON FORGOTTEN.

WITHIN A YEAR AFTER DISCHARGE FROM ACTIVE DUTY, I BEGAN TO EXPERIENCE BACK PAINS AND FILED A CLAIM WITH THE VETERANS ADMINISTRATION. BY CURSORY EXAMINATION THE V A DOCTOR FOUND NO DISABILITY AND THE CLAIM WAS DENIED.

SHORTLY AFTER THAT, AND ALSO WITHIN THAT FIRST YEAR AFTER DISCHARGE, I DEVELOPED SINUS ALLERGIES AND WENT TO A PRIVATE PHYSICIAN FOR TREATMENT. DESPITE CONTINUOUS TREATMENT THIS ALLERGY PROBLEM HAS WORSENED OVER OF THE PAST FORTY-NINE YEARS.

DURING THOSE POST MILITARY YEARS, FROM 1945 TO 1969, I WAS ABLE TO OPERATE A SUCCESSFUL FAMILY RESTAURANT BUSINESS IN ROCHESTER, NEW YORK. THROUGH ALL OF THOSE YEARS, I HAVE WONDERED IF PERHAPS THE IRRADIATION DOSES GIVEN TO ME IN 1945 COULD HAVE BEEN THE SOURCE OF MY ALLERGY PROBLEMS.

IN 1969, WHEN I WAS 45 YEARS OLD, I SUFFERED A MAJOR HEART ATTACK FOR WHICH I WAS HOSPITALIZED AT THE UNIVERSITY OF ROCHESTER, NEW YORK, GENESSEE HOSPITAL CAMPUS. FOLLOWING THIS I WAS PRONOUNCED PERMANENTLY AND TOTALLY DISABLED. SINCE 1969, I HAVE BEEN UNABLE TO WORK AND EARN ANY MONEY. I DID NOT FEEL THAT FILING ANOTHER CLAIM WITH THE V. A. WOULD BE ANY DIFFERENT THAN WAS MY EARLIER EXPERIENCE.

IN RECENT YEARS, I HAVE SUFFERED THE SECOND AND THIRD HEART ATTACKS REQUIRING HOSPITALIZATION AND CONVALESCENCE. I HAVE ALSO DEVELOPED SEVERE ARTHRITIS, DIABETES, AND SUFFERED A STROKE. THESE PHYSICAL PROBLEMS HAVE ALL REQUIRED EXPENSIVE MEDICAL TREATMENT AND COSTLY PRESCRIPTION MEDICATIONS IN ADDITION TO A DEBILITATED LIFESTYLE.

THE RECENT CHANGE IN GOVERNMENT POLICY, AS ANNOUNCED BY SECRETARY OF ENERGY, HAZEL O'LEARY, REVEALED THERE WAS GOVERNMENT APPROVED IRRADIATION TESTING PERFORMED ON HUMAN SUBJECTS. I DO NOT KNOW IF ANY OF THE OTHER CASES THAT HAVE BEEN IDENTIFIED THUS FAR IN ANY WAY RESEMBLE MY EXPERIENCE, BUT I WOULD LIKE TO KNOW. I HAVE KEPT MY ORIGINAL DOCUMENT COPIES OF MY RECORDS AS EVIDENCE THAT IT HAPPENED. I HOPE YOU CAN SEE THAT OVER THE PAST FORTY-NINE YEARS I HAVE HAD STRONG REASON TO WONDER IF I HAD BEEN UNWITTINGLY USED AS A HUMAN GUINEA PIG IN 1945.

I HAVE LEARNED THAT AN EXECUTIVE ORDER WAS SIGNED BY PRESIDENT CLINTON, CALLING FOR THE APPOINTMENT OF A SPECIAL ADVISORY COMMITTEE, TO WORK WITH THE DEPARTMENT OF ENERGY TO INVESTIGATE THESE EARLY EXPERIMENTATIONS WITH RADIATION. I AM TOLD THAT APPOINTMENTS TO THIS ADVISORY GROUP WILL BE SELECTED FROM GOVERNMENT PHYSICIANS AND OTHER PROFESSIONAL EXPERTS IN THE FIELD OF RADIATION. I HOPE THAT YOU WILL INSIST THAT SOME OF THE APPOINTEES TO THAT ADVISORY GROUP MUST INCLUDE SUBJECTS THAT WERE ILLEGALLY TESTED.

IF IT IS DETERMINED THAT THE SUBJECTS USED IN THE IRRADIATION STUDIES ARE JUSTLY ENTITLED TO BE COMPENSATED FOR LOSSES THAT WERE CAUSED BY THIS INVOLUNTARY TESTING, I ASK THAT THE ISSUES BE REDRESSED QUICKLY. AT A MINIMUM, I THINK WE ALL DESERVE A FORMAL APOLOGY FROM OUR GOVERNMENT.

THANK YOU.

HEADQUARTERS THIRD AIR FORCE IRRADIATION CLINIC DREW FIELD
Office of the Director of Irradiation

Tampa, Florida
31 July 1945
(Date)

SUBJECT: Irradiation Treatment, M. SINI, ANDREW E. S/Sgt 32938856
(Name) (Rank)

TO : Flight Surgeon Concerned.

The above named Officer/enlisted man has received Irradiation Treatments for aero-otitis at this Clinic as indicated. He should receive his next treatment 25 days following the last treatment received.

1st Treatment 10 August 1945 50 mg, 2 app, 8½ min.
2nd Treatment 31 August 1945 50 mg, 2 app, 8½ min.
3rd Treatment 26 September 1945 50 mg, 2 app, 8½ min.

Request that WD AGO Form #206 be checked, and proper entry of these treatments be made.

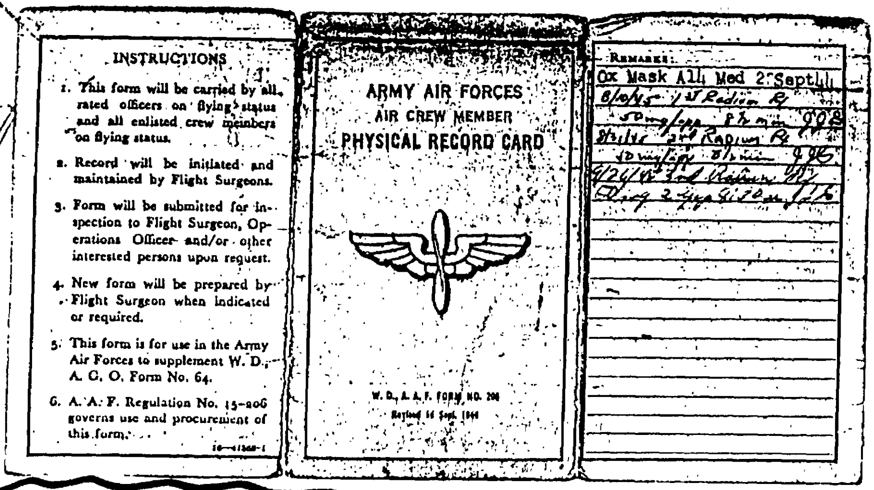
Every effort should be made to have this man receive the complete series of three (3) treatments.

JWS
JOHN W. SMITH,
Major, M.C.,
Director of Irradiation

DEPT —
THIS PAGE IS A
DUPLICATE OF Folio 125

REMOVE BEFORE PRINTING

SHF #568 (AD-3)



INSTRUCTIONS

1. This form will be carried by all rated officers on flying status and all enlisted crew members on flying status.
2. Record will be initiated and maintained by Flight Surgeons.
3. Form will be submitted for inspection to Flight Surgeon, Operations Officer and/or other interested persons upon request.
4. New form will be prepared by Flight Surgeon when indicated or required.
5. This form is for use in the Army Air Forces to supplement W. D., A. G. O. Form No. 64.
6. A. A. F. Regulation No. 15-206 governs use and procurement of this form.

16—41568-1

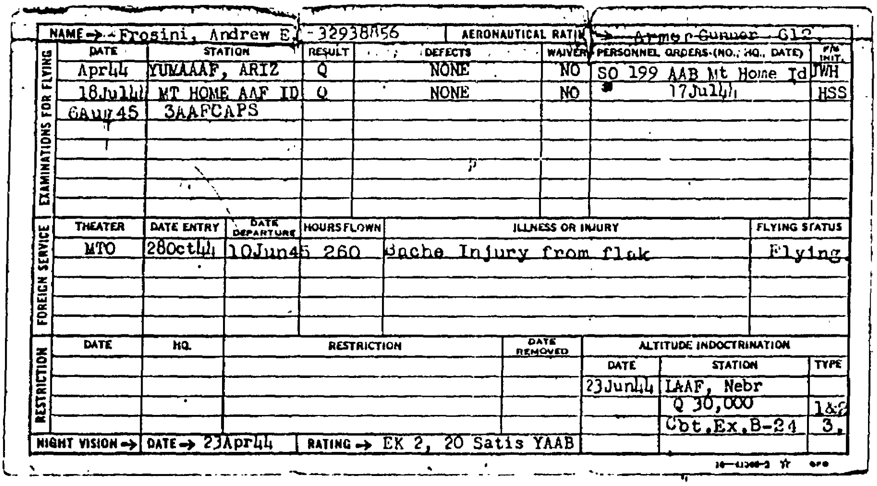
ARMY AIR FORCES
AIR CREW MEMBER
PHYSICAL RECORD CARD

W. D., A. A. F. FORM NO. 20[illegible]
Revised 16 Sept. 194[illegible]

REMARKS:

Ox Mask A14 Med 2 Sept44
8/10/45 1st Radium Rx
50 mg/hr 8 hr min [illegible]
8/11/45 2nd Radium Rx
50 mg/hr 8 hr min [illegible]
8/24/45 3rd Radium Rx
[illegible] 2 [illegible]

DEPT — THIS IS A DUPLICATE OF FOLIO 126



NAME → Frosini, Andrew E. - 32938856 AERONAUTICAL RATING → ~~Armor Gunner 612~~

EXAMINATIONS FOR FLYING

DATE	STATION	RESULT	DEFECTS	WAIVER	PERSONNEL ORDERS (NO., HQ., DATE)	F/S INIT.
Apr44	YUMAAAF, ARIZ	Q	NONE	NO	SO 199 AAB Mt Home Id	JWH
18Jul44	MT HOME AAF ID	Q	NONE	NO	17Jul44	HSS
6Aug45	3AAFCAPS					

FOREIGN SERVICE

THEATER	DATE ENTRY	DATE DEPARTURE	HOURS FLOWN	ILLNESS OR INJURY	FLYING STATUS
MTO	28Oct44	10Jun45	260	Bache Injury from flak	Flying.

RESTRICTION

DATE	HQ.	RESTRICTION	DATE REMOVED

ALTITUDE INDOCTRINATION

DATE	STATION	TYPE
23Jun44	LAAF, Nebr	
	Q 30,000	1&2
	Cbt.Ex.B-24	3.

NIGHT VISION → DATE → 23Apr44 RATING → EK 2, 20 Satis YAAB

16—41368-2 ☆ GPO

HEADQUARTERS THIRD AIR FORCE IRRADIATION CLINIC DREW FIELD
Office of the Director of Irradiation

Tampa, Florida

31 July 1945
(Date)

SUBJECT: Irradiation Treatment, SINI, ANDREW E. S/Sgt 32938856
(Name) (Rank)

TO : Flight Surgeon Concerned.

The above named Officer/enlisted man has received Irradiation Treatments for aero-otitis at this Clinic as indicated. He should receive his next treatment 25 days following the last treatment received.

1st Treatment 10 August 1945 50 mg, 2 app, 8½ min.
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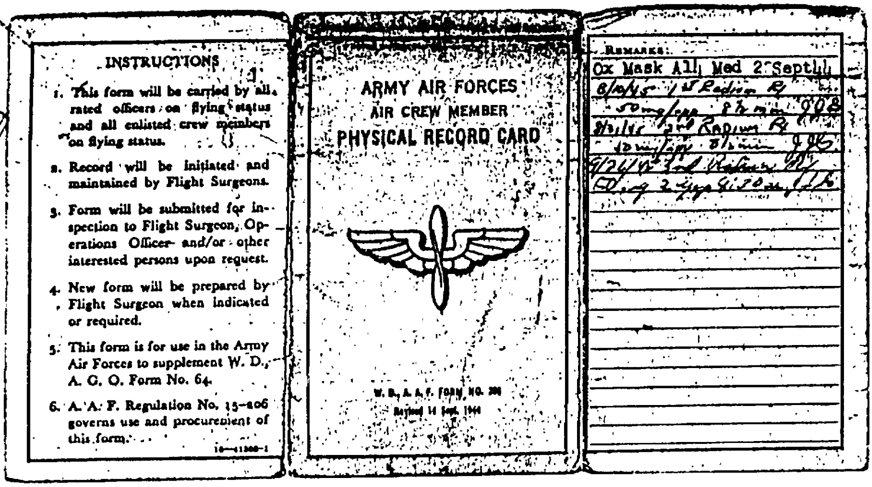
3rd Treatment 26 September 1945 50 mg, 2 app, 8½ min.

Request that WD AGO Form #206 be checked, and proper entry of these treatments be made.

Every effort should be made to have this man receive the complete series of three (3) treatments.

JWS
JOHN W. SMITH,
Major, M.C.,
Director of Irradiation

SHF #568 (AD-3)



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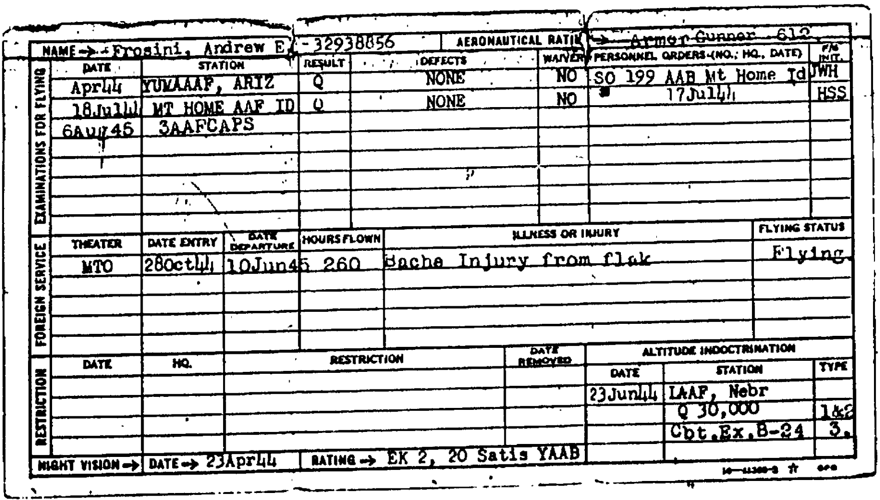
6. A. A. F. Regulation No. 15-206 governs use and procurement of this form.

16—41300-1

ARMY AIR FORCES
AIR CREW MEMBER
PHYSICAL RECORD CARD

W. D., A. A. F. FORM NO. 30
Revised 14 Sept. 1944

REMARKS:
Ox Mask All Med 2 Sept44
8/10/45 1st Radium Rx
50 mg/hr 8½ min [illegible]
8/31/45 2nd Radium Rx
50 mg/hr 8½ min [illegible]
9/24/45 3rd Radium Rx
50 mg 2 hr [illegible]



NAME → Frosini, Andrew E. - 32938856   AERONAUTICAL RATING → ~~Armor Gunner 612~~

EXAMINATIONS FOR FLYING

DATE	STATION	RESULT	DEFECTS	WAIVER	PERSONNEL ORDERS (NO.; HQ., DATE)	F/S INIT.
Apr44	YUMAAAF, ARIZ	Q	NONE	NO	SO 199 AAB Mt Home Id	JWH
18Jul44	MT HOME AAF ID	Q	NONE	NO	17Jul44	HSS
6Aug45	3AAFCAPS					

FOREIGN SERVICE

THEATER	DATE ENTRY	DATE DEPARTURE	HOURS FLOWN	ILLNESS OR INJURY	FLYING STATUS
MTO	28Oct44	10Jun45	260	Bache Injury from flak	Flying

RESTRICTION

DATE	HQ.	RESTRICTION	DATE REMOVED

ALTITUDE INDOCTRINATION

DATE	STATION	TYPE
23Jun44	LAAF, Nebr	
	Q 30,000	1&2
	Cbt.Ex.B-24	3.

NIGHT VISION → DATE → 23Apr44   RATING → EK 2, 20 Satis YAAB

16—41300-2 ☆ GPO

Mr. **BRYANT**. At this time we will hear from Mr. Nathan Schnurman.

Thank you for being here.

STATEMENT OF NATHAN J. SCHNURMAN

Mr. **SCHNURMAN**. Thank you, Mr. Chairman, distinguished members of this committee, honorable Congressmen, distinguished guests, ladies and gentlemen, thank you for the privilege of allowing me to present before this committee. The story I will be telling you today unfortunately is one of inducement, deception, intimidation and lies for the purpose of enticing unwitting healthy males to be used as human guinea pigs for the production of injuries under tropical conditions produced by heat and humidity while locked in a gas chamber and exposed to lethal war agents, crude sulfur mustard gas and lewisite containing arsenic.

In the Man Break experiments, the purpose was to produce, not to treat, the injuries for study by the Committee for Medical Research. Army personnel served under field conditions with exposure to vesicant agents designed to mimic concentrations of World War I that produced injuries as well.

The men were identified as "volunteers." However, the volunteer status ceased upon their arrival at the experimental site at which time they came under orders to participate in the experiments, furthermore, under the threat of court-martial and a charge of treason, if they ever divulged information relating to their participation in or information relating to these experiments.

Men were told they would be awarded a citation in appreciation of their extraordinary contribution to the war effort and would be made a part of their service record. When these veterans applied for service connected benefits due to vesicant injuries as the etiology of their medical condition, their claims were denied as no such record was ever placed in their service or medical file.

This story for me began 50 years ago, as a matter of fact. Fifty years ago last week. A coincidence, I prefer should never again be repeated.

You have before you a copy of approval for these actions signed by Robert Patterson, the Acting Secretary of the War, dated May 7, 1942, affording permission to use human volunteers for experiments with chemical warfare agents. You also have a copy of approval from the Department of the Navy to use humans in pursuit of scientific investigation of war gasses dated May 8, 1942, and signed by the Acting Secretary of the Navy, the Honorable James Forrestal. Copies are made available for your convenience.

Let me begin by telling you how volunteers were seduced and used as guinea pigs for these experiments. In a weekly report from the Navy medical liaison officer to the Bureau of Medicine and Surgery Research Division, dated April 3, 1943, a log of activities states:

> Friday, went with Commander Dole to the navy yard to arrange for human volunteers for gas testing work. This idea was found to be unsatisfactory and it was suggested we contact the Naval Training Station located at Bainbridge, MD.

How to obtain humans became the question of concern. To use prisoners of war was illegal and would be a world issue. Such treatment is addressed in the Geneva Conference Agreement. The use of humans incarcerated at the Harts Island Naval Prison was also considered, but would have to be limited in scope. However, I understand many prisoners were enticed to volunteer. The experiments were limited to patch tests and wearing of impregnated clothing, again with no record of their service.

In a followup suggestion of the Navy personnel, a letter was formulated to the commanding officer at Bainbridge from the Director of the Naval Research Laboratories, which he included praise for the Great Lakes naval training commanding officer for permitting his personnel to be used for like-type experiments that were ongoing at the University of Chicago Toxicity Laboratory, under contract to the Chemical Warfare Services financed by the Army.

This was a project, demanding in the interest of national defense and approved by the Department of War, Navy Bureau of Personnel, the Bureau of Ships, but was taken under cognizance by the Navy Bureau of Medicine and Surgery due to the known physiological effects of these agents.

The Naval Research Laboratory memo to Rear Admiral Smith, log of activities, dated October 4 through October 10, Wednesday: "went to the Naval Training Station in Bainbridge, MD, to check on the possibility of obtaining human volunteers from that activity."

And thus began the flow of humans at a rate of approximately 30 men each week, to be used by NRL at Anacostia in chemical warfare experiments. The Naval Research Laboratory maintained a Navy Unit, stationed at Edgewood Army Chemical Center, Edgewood Arsenal from 1925 until 1975 to act as a liaison between the Army and the Navy.

The National Defense Research Committee was funding research conducted by the Naval Research Laboratory. They also directed what studies were to be carried out. Edgewood was to be used as the pilot plant of the NRDC with NRL to limit the concentration of vesicants, to which humans were to be subjected in the "Man Break" experiments. In these experiments, the subject was to be brought to the casualty level.

In late January 1944, fresh out of basic training and assigned to the outgoing unit awaiting transfer for special training, the offer was made for men who would like to do something in the interim. This was for a limited number of volunteers to test summer clothing, and with an added incentive, the men would be given a 3-day pass for the weekend. I naturally assumed if this was a Navy summer clothing test, warm weather would be a prerequisite. Surely, it must in the south, Georgia, or perhaps even Florida. After all, there in Bainbridge, it was a very cold winter. Put my name on that list.

Upon arriving at the quonset huts at Edgewood, we were ordered to remove our clothing, including underclothing, socks and shoes. We were issued khaki underwear, khaki socks, heavy type of overalls and light type jacket, gas mask, rubber overshoes with metal latches and rubber, long-sleeved gloves.

Prior to leaving this quonset, a blood test was drawn for the evaluation to determine if we were healthy. We put this Navy summer clothing on. We were instructed in the use of the gas mask, and ordered to put it on in a manner to afford protection.

We were marched out the back door of this quonset around a structure where a small appendage was attached to the quonset and used as a gas chamber to mimic tropical conditions such as heat and humidity in the presence of vesicant agents, crude sulfur mustard gas in a 50–50 mixture with lewisite. Once the door closed, it was locked. There was no available exit until the experiment concluded. This was 60 minutes each day in succession.

However, it is interesting to note the concentration was checked every 5 minutes wherein as the concentration diminished due to the absorption into the protective clothing and then on to the skin where it was picked up by the blood and carried to every organ of the body within a period of 5 minutes. This amount was replenished. The effects of the agent are both cumulative and radiomimetic. It is impossible to determine the total values of the agents to which we were subjected as the additional vesicants are not included in the scientific notebooks or log information.

Upon leaving the chamber, we were allowed to remove the gas mask and gloves prior to boarding an army bus for the noon meal. It was mandatory we should wear the contaminated clothing an additional 4 hours. Naturally, after returning from lunch with time to spare, we would rest on the army cot and khaki blankets. What was happening, naturally, as we were not only being exposed to vesicants in the chamber by inhalation and so forth, but continuous exposure during the time we wore this clothing which produced percutaneous absorption, picked up and distributed by the blood, ingestion by having to eat while wearing the contaminated clothing, and continuing contamination from sleeping under the contaminated blankets.

The injuries were evaluated each day prior to returning to the gas chamber for more of the same. After three or four exposures, it was determined blood checks would no longer be mandatory prior to entering the chamber. In truth, by this time the blood confirmed systemic intoxication was present, and served no further need.

Again, I became very ill in the chamber on the sixth exposure. I requested to be released. Permission was denied. Within seconds after the second denial I passed out in the chamber. What happened after that, I don't know. I may only assume that when I was removed from the chamber, I was presumed dead.

When I came to, I was lying on a pile of snow at the side of the road. There was no one in sight. I tried to either remove my gas mask or pull it to the side of my face in order to obtain a breath of air as I had thrown up in the gas mask. At this time I experienced my first heart attack. After years of repeated experiences, I diagnosed this as myocardial infarct.

As long-term medical consequences, I am well acquainted with the difference between an infarct, ASHD, angina, numerous pulmonary embolus, now rated as emboli, has rendered me totally disabled. My myriads of medical problems, well-documented and confirmed by medical authority, including Alfred Gilman, Ph.D., Yale University, coauthor of Goodman & Gilman Handbook on Medical Pharmacology, relating to my exposures to the vesicants, crude sulfur mustard gas and lewisite.

The next day I was dressed by two corpsmen, put on a bus, taken to a train station that had only one set of tracks, given a ticket to go home, and they said "don't come back here, report back to Bainbridge. You wouldn't know where to find us anyway."

I am proud to have served my country. At this time I must point out that the Department of Veterans Affairs has afforded me excellent medical care. However, the Department of Veterans Affairs now proposes to amend title 38, Code of Federal Regulations, (CFR), subsection 3.316 to include findings of the Institute of Medicine released January 6, 1993.

However, I find it unfortunate, the Department of Veterans Affairs fails to include documented medical findings that confirm a correlation of heart conditions, ASHD, Bradycardia, vascular disease and neurological disorders, all related to and documented as long-term chronic effects of exposures to the vesicant agents, sulfur mustard in either liquid form or gas, nitrogen mustards and lewisite, which contains arsenic, a known chemical agent related to polyneuropathy.

Gilbert W. Bebee, Ph.D., Yale University, Institute of Medicine published his findings in 1960, in connection with the Department of Veterans Affairs relating to long-term medical effects of exposure by mustard gas with World War I veterans from 1919 through 1955. His study well documents the acute and chronic long-term medical effects using in excess of 7,000 men, with controls.

Concerning the findings, they also include medical statements from the Dr. John Stroney, M.D., relating to the agglutinate of the blood. A letter to the Honorable Barney Frank from Dr. Mark Cullen, from an IME requested by the Board of the Veterans' Administration. This is no longer a question of affording claimants the benefit of the doubt, as many favorable medical findings conclude the acute and long-term chronic probability of the known health effects related to injury by these vesicant agents. The DVA should address this issue favorably.

Seventy-five years since World War I; 50 years of suffering for most of the living veterans of World War II. We do not have many years left to address this issue. Secretary Brown, Department of Veterans Affairs, in reply to a question posed by a reporter shortly after his confirmation as Secretary for the Department of Veterans Affairs, as to his knowledge about mustard gas issue, answered: "I know it produces accelerated aging." That was in February 3, 1993, 1 year tomorrow. He is so right. Those of us who are still here, respectfully request Secretary Brown address this issue in a timely and favorable manner.

Thank you for permitting me to present. I am willing to answer any questions you may have.

[The prepared statement of Mr. Schnurman follows:]

Statement For Presentation To The Subcommittee on Administrative Law and Governmental Relations House Of Representatives

February 2, 1994

Submitted by: Nathan J. Schnurman

Mr. Chairman, Distinguished Members of This Committee, Honorable Congressmen, Distinguished Guests, Ladies and Gentlemen Thank you for the privilege of allowing me to present before this Committee

The story I will be telling you today, unfortunately is one of inducement, deception, intimidation and lies for the purpose of enticing unwitting healthy males to be used as human guinea pigs, for the production of injuries under tropical conditions produced by heat and humidity, while locked in a gas chamber and exposed to lethal war agents, Crude Sulphur Mustard gas and Lewisite, containing Arsenic. In the Man Break experiments, the purpose was to produce, not to treat the injuries for study by the Committee For Medical Research (CMR). Army personnel served under field conditions with exposure to vesicant agents designed to mimic concentrations of World War 1, that produced injuries.

The men were identified as "volunteers." However, the volunteer status ceased upon their arrival at the experimental site at which time, they came under orders to participate in the experiments. Furthermore, under the threat of Court Martial and a charge of "Treason" if they ever divulged information relating to their participation in or information relating to these experiments.

Men were told they would be awarded a citation in appreciation of their extraordinary contribution to the war effort and would be made a part of their service record. When these veterans applied for service connected benefits due to vesicant injuries as the etiology of their medical condition, their claims were denied, as no such record was ever placed in their service or medical file.

This story for me, began fifty years ago. A coincidence, I prefer should never again be repeated. You have before you a copy of approval for these actions, signed by Robert Patterson., Acting Secretary of War, dated May 7, 1942, affording permission to use human "volunteers" for experiments with chemical warfare agents. You also have a copy of approval from The Department of The Navy to use humans in pursuit of scientific investigation of war gasses dated May 8, 1942 and signed by the Acting Secretary of the Navy, The Honorable James Forrestal. (Copies are made available for your convenience)

Now let me begin by telling you how "volunteers" were seduced, and used as human guinea pigs for these experiments. In a weekly report from the Navy Medical Liaison Officer, to the Bureau of Medicine and Surgery (BuMed&Sur) Research Division, dated: 3 April 1943, From: The Naval Research Laboratory (NRL) Medical Liaison Officer, Lt. Cmdr. L. B. Daily (M.C.) U.S.N. To: BuMed&Sur. Attn: R/A H. W. Smith Subj: Log of Activities 43-03-29 thru 43-04-03 (c1287) "Friday: Went with Comdr. Dole to Navy Yard to arrange for human volunteers for gas testing work. "This idea was found to be unsatisfactory and it was suggested we contact the Naval Training Station (NTS) located in Bainbridge, MD.

How to obtain humans became the question of concern. To use prisoners of war (POWs') was illegal and would be a world issue. Such treatment is addressed in the Geneva Conference Agreement. The use of humans incarcerated in the Harts Island Naval Prison was also considered, but would have to be limited in scope. However, I understand many prisoners were enticed to volunteer. The experiments were limited to patch tests and wearing of impregnated clothing, again with no record of their service.

To follow-up the suggestion of using navy personnel, a letter was formulated to the Commanding Officer, Bainbridge Naval Training Station From: Director NRL, dated: 6 April '43 (c492) which included praise for the Great Lakes Naval Training Commanding Officer for permitting his enlisted personnel be used for like type experiments that were on-going at the University Of Chicago Toxicity Laboratory; under contract to the Chemical Warfare Service, financed by the Army.

This was a project, demanding in the interest of National Defense and approved by the Department of War, Navy Bureau of Personnel (BuPers). The Bureau of Ships (BuShip) but taken under cognizance by the Navy Bureau Of Medicine and Surgery (BuMed/Sur) due to the known psychological effects of these vesicant agents.

To: C/O NTS Bainbridge, Subj: Human Volunteers for Skin Tests with vesicant gasses and anti vesicant materials. "The amount of injury resulting from these particular tests is very slight, being limited to a few small skin burns." Lt. Cmdr. Daily being sent to explain.

From: Director: NRL To: BuMed/Sur. Date: 43-04-09 (c493)
Subj: "Further Explanation of proposed Human Being Volunteer Tests"
(a) Simple skin tests. (b) Gas Chamber Tests. In these tests the individual is placed in a gas chamber containing a known concentration of gas controlled by a chemist and in the presence of a medical officer. Occasionally in these tests there is bound to be a casualty varying from mild to moderately severe skin burns.

NRL To: Res. Div. Bu Med&Sur. (c1288) Memo: To: Rear Admiral Harold W. Smith Date: 43-10-04
Subj: Log of Activities Oct. 4 through 10 1943.
Wed: Went to USNTS Bainbridge, MD to check on possibility of obtaining human volunteers from that activity.

Thus began the flow of humans at a rate of approximately 30 men each week, to be used by NRL, Anacostia; in chemical warfare experiments. The NRL maintained a Navy Unit, stationed at Edgewood Army Chemical Center, Edgewood Arsenal (E.A.) MD (from 1925 until 1975) to act as liaison between the Army and Navy.

The National Defence Research Committee (NDRC) was funding research conducted by NRL, they also directed what studies were to be carried out. Edgewood was used as the Pilot Plant by NDRC, with NRL to limit the concentration of vesicants, to which humans were to be subjected in the "Man Break" experiments. In these experiments, the subject was to be brought to the casualty level.

In late January 1944, fresh out of basic training and assigned to the "Out Going Unit" awaiting transfer for special training, the offer was made for men who would like to do something in the interim. This was for a limited number of 'volunteers" to test Navy Summer Clothing; and with added incentive, the men would be given a (3) day pass for the weekend, upon completion of their assignment. I naturally assumed if this was a Navy Summer Clothing test, warm weather would be a prerequisite. Surely, it must be in the South -Georgia or perhaps even Florida. After all, there in Bainbridge, it was a very cold winter. Put my name on that list.

The following day, I was instructed to store all issued blankets, mattress, clothing with the exception of my dress uniform, a change of under clothing and personnel items, i. e. razor, tooth brush, etc. I boarded a Navy bus, with several others, unknown to me, and assumed we may be heading for a train station. Since it appeared we were not travelling the highway, it could be we were to be flown to this summer location.

In approximately one hour or less, the bus stopped on a dead-end road, in which there was two Quonset huts and no sign of life. Two of the passengers and myself were ordered to disembark the bus. Surely there must be some mistake. It was still winter time here, and very cold. A Corpsman appeared and motioned us to follow him to one of the Quonsets. He issued us an Army Cot and two Army Khaki woolen blankets. We were told to place the cots anywhere in the Quonset we wished.

This structure had but one small light bulb hanging over a wooden picnic table. There was a "pot-bellied" coal stove in the center of the Quonset, with a whole cut in the top of the Quonset for the stove pipe to exit. About two tons of coal was dumped on the floor near the stove. This was the heat provided to the men living in this structure, which numbered about 6 or 7 total. There was no water, for drinking, no shower, or toilet facilities. If there was a need for these luxuries, we should go to the other Quonset #2, which contained such facilities. There were even showers, a water fountain, sinks and toilet facilities and most important, heat supplied by an oil furnace.

The next morning, we reported to Quonset #2 after travelling via a small Army Bus back and forth to an Army Mess Tent in this remote location. Food was provided for the Navy men stationed here and used for this Navy Summer Clothing experiment. The cooks were also Army, as they were dressed in their woolen khaki jackets. What stood out to identify these three men as cooks, they wore white aprons and white cook's hats. The food was eatable, but a far cry from what we experienced at Bainbridge.

Upon arriving back to the Quonsets, we were ordered to remove our clothing, including under clothing, socks and shoes. We were issued khaki underwear, khaki socks, and heavy type overalls with a like type jacket, a gas mask, rubber overshoes with metal latches, and rubber long sleeve gloves. Prior to leaving this Quonset, a blood test was drawn for evaluation, to determine we were healthy. We put this Navy Summer Clothing on. We were instructed in the use of the gas mask, and ordered to put it on, in the manner to afford protection.

We were marched out the back door of this Quonset, around the structure where a small appendage was attached to the Quonset and used as the Gas

Chamber to mimic tropical conditions, i. e. heat and humidity in the presence of vesicant agents, crude sulphur mustard gas in a 50 - 50 mixture with Lewisite (contains Arsenic). Once the door closed, it was locked. There was no available exit, until the experiment concluded that day. This was 60 minutes each day in succession.

The C/T factor was determined by the known concentration of vesicant at the beginning chamber experiment and the known concentration at the completion of the experiment, and dividing these known factors by 2, to relate the findings as the average concentration; i. e. 20 mg vesicant ∂ (gamma, indicative as radiomimetic) per liter, per cubic meter = 20 mg. times X time (number of minutes) = 20 X 60 =1200 C/T.

However, it is interesting to note the concentration was checked every 5 minutes wherein as the concentration diminished due to the absorption into the protective clothing, and then onto the skin, where it was picked up by the blood and carried to every organ of the body within a period of 5 minutes. This amount was replenished. The effects of the agents are both cumulative and radiomimetic. It is impossible to determine the total values of the agents to which we were subjected, as the additional vesicants are not included in the Scientific Notebook (S/N) or log information.

Upon leaving the chamber, we were allowed to remove the gas mask and gloves, prior to boarding the Army Bus for the noon meal. It was mandatory we should wear the contaminated clothing an additional 4 hours. Naturally after returning from lunch, with time to spare, we would rest on the Army Cot and khaki blankets. What was happening naturally, as we were not only being exposed to vesicants in the chamber, but continuous exposure during the time we wore this clothing, which produced percutaneous absorption, picked up and distributed by the blood; ingestion by having to eat while wearing the contaminated clothing and continuing contamination from sleeping under the contaminated blankets.

The injuries were evaluated each day, prior to returning to the gas chamber for more of the same. After 3 or 4 exposures, it was determined blood checks would no longer be mandatory, prior to entering the chamber. In truth, by this time the blood confirmed systemic intoxication was present, and served no further need.

During my 6th. exposure in the chamber, I determined something was wrong. I called to the Corpsman, via an intercom, and informed him of my condition, and what was happening and requested I be released from the chamber, now. The reply was, I will check with the "Powers to Be" and be right back. The reply was "No" as they had not completed the experiment. I became very nauseous. Again, I requested to be released from the chamber. Again, permission was denied. Within seconds after the denial, I passed out in the chamber. What happened after that, I don't know. I may only assume, when I was removed from the chamber, it was presumed I was already dead.

When I came to, I was lying on a pile of snow, at the side of the road. There was no-one in sight. I tried to either remove my mask, or pull it to the side of my face, in order to obtain a breath of air as I had thrown up in the gas mask. At this time I experienced my first heart attack. After years of repeated experiences, I diagnosed this as myocardial infarct.

As long term medical consequences, I am well acquainted with the difference between the "Infarct" and "ASHD." This, with numerous pulmonary embolus now rated as emboli has rendered me totally disabled. My myriads of medical problems are well documented and confirmed by medical authority including Alfred Gilman, Ph.D., Yale University (Co-author, Goodman and Gilman handbook on "Medical Pharmacology") relating to my exposures to the vesicants, crude sulphur mustard gas and Lewisite, containing Arsenic.

The next day, I was physically dressed by two Corpsmen, informed I would not be going back to the gas chamber again. My duty there was completed. They were going to send me home, not just for three days, but for ten days. I was to report back to Bainbridge, as they were moving and I wouldn't know where or how to find them. They furnished me with a round trip train ticket, transported me to the train station, one you would never know was a train station. There was one set of tracks, with a button block to prevent the train from travelling any further. The train consisted of the engine and three coaches. The Corpsmen had to physically carry me up the steps of the train and place me in a seat. I was weak, I was very ill. I requested they return me to Bainbridge. Request denied. Upon my arrival home, I developed pneumonia, bloody stools, rupture of the many blisters produced by vesicant burns, expelling the mucous membrane of both nostrils, I could speak, but only in a very hoarse and painful voice, my eyes and throat continued to burn. I remained in bed for nine of the ten days. On the nineth day, I sought the assistance of a physician (ENT) and requested he please do something for me. He recommended I go to a hospital. I was under the impression, if I did not return on time, I would be charged with AWOL. This doctor treated me. I returned to Bainbridge with packing still in my nostrils, a very ill person.

I am proud to have served my country. At this time, I must point out, the Department of Veterans Affairs (DVA) has afforded me excellent medical care. However, the DVA now proposes to amend 38 Code Of Federal Regulations (CFR) § 3.316 to include findings of the Institute of Medicine, released 6 January 1993.

I find it unfortunate, the DVA fails to include documented medical findings that confirm a correlation of Heart conditions (ASHD), Bradycardia, Vascular diseases and Neurological disorders all related and documented as long term chronic effect of exposures to the vesicant agents, Sulphur Mustard in either liquid form or gas, Nitrogen Mustards and Lewisite, which contains Arsenic, a known chemical agent related to poly-neuropathy, et. al.

Gilbert W. Bebee, Ph.D. Yale University, Institute of Medicine in published his findings in 1960, in connection with the DVA, relating to long-term medical effects of exposure by mustard gas with World War I veterans from 1919 through 1955. His study, well documents the acute and chronic long-term medical effect in excess of 7,000 men with controls.

Findings by the Institute of Medicine in a $600,000. study, released January 6, 1993 mimic much of the same findings by, Bebee.

This is no longer a question of affording claimants the "benefit of doubt" as many favorable medical findings conclude the acute and long-term chronic probability of the known health effects related to injury by these vesicant agents. The DVA should address this issue favorably.

Seventy-five years since World War 1; Fifty years of suffering for most of the living veterans of World War 11. We do not have many years left to address this issue. Secretary Brown, DVA in reply to a question posed by a reporter shortly after his confirmation as Secretary For The DVA as to his knowledge about the Mustard Gas Issue, answered "I know it produces accelerated aging." He is so right. Those of us who are still here respectfully request the Secretary Brown address this issue, in a timely and favorable manner.

Thank you for permitting me to present. I am willing to answer any questions you may have.

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REPRODUCED FROM THE COLLECTIONS
OF THE ARCHIVES OF THE
NATIONAL ACADEMY OF SCIENCES

May 7, 1942

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Dr. Alfred N. Richards, Chairman
Committtee on Medical Research
2101 Constitution Avenue,
Washington, D. C.

My dear Doctor Richards:

Reference is made to your communication of April 7, 1942, relative to the use of volunteer soldiers for experiments with chemical warfare agents.

The proposal for the use of volunteer subjects from the ranks of the U.S. Army for tests with chemical warfare agents which will involve no permanent injury is approved in principle.

Since much of the experimental work with gas is done at Edgewood Arsenal, Maryland, the details of any plan to be submitted should be coordinated with the Chief, Chemical Warfare Service and with The Surgeon General.

Sincerely yours,
S/ Robert Patterson
ACTING Secretary of War.

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OF THE ARCHIVES OF THE
NATIONAL ACADEMY OF SCIENCES

COPY

DEPARTMENT OF THE NAVY (3.
Office of the Secretary
Washington

May 8, 1942

My dear Doctor Richards:

This will acknowledge your letter of April 7, 1942 with reference to scientific investigation of war gases.

As Secretary of the Navy I authorize the proposed investigation which shall be carried out in a manner subject to the approval of the Surgeon General.

Sincerely yours,

S/ James Forrestal
Acting Secretary of the Navy

Dr. Alfred N. Richards
Chairman, Committee on Medical Research
Office of Scientific Research and Development
1530 P Street, N. W.
Washington, D. C.

Mr. BRYANT. Thank you, Mr. Schnurman.

We thank all of the witnesses for being here. The Chair will recognize himself for a first round of questioning.

Mr. Schnurman, the story that you just told us would cause anyone to be angry to hear it, angry that it could have happened. Who was it that told you that they would not allow you to cease the testing after you became sick?

Mr. SCHNURMAN. I am sorry. I am missing a lot of what you said.

Mr. BRYANT. Who was it that refused to permit you to cease participation in the testing after you became sick?

Mr. SCHNURMAN. The—whomever was in charge of the experiments at the Edgewood Chemical Center. There were only about seven of us there, and this was controlled. It was being conducted by the National Defense Research Committee.

Mr. BRYANT. How many days did you participate in this experiment?

Mr. SCHNURMAN. Six days in succession, the effects of which are cumulative, as well as radiomimetic, according to Alfred Gilman.

Mr. BRYANT. Are you receiving any compensation now?

Mr. SCHNURMAN. Yes; 100-percent service connected from the Veterans' Administration, for which I am grateful, but it only took 17 years to establish that.

Mr. BRYANT. But that is compensation for the injury which you have described today?

Mr. SCHNURMAN. Absolutely, sir.

Mr. BRYANT. All right. Thank you.

Mr. Frosini, who in the chain of command gave you orders to undergo the radiation treatments?

Mr. FROSINI. That is documented in the copy I have submitted. It was the third—the Headquarters, Third Air Force Irradiation Clinic, Drew Field, Office of the Director of Irradiation, signed John W. Smith, Major, M.C., Director of Irradiation, and it gives the dates that I was administered the treatments.

I would like to state that after my first treatment at Drew Field, I was transferred to Thomasville, GA. I was awaiting transfer to the Pacific Theater of Operation for continuous combat duty, and they provided me with an aircraft and a pilot flying me back 25 days later for treatment No. 2, and then again 25 days later for treatment No. 3. I did have a copy that commanded the commander of the base that superseded his command that I return to that base where my original treatment was given to complete the series of three.

Mr. BRYANT. OK. Mr. Frosini, specifically, what makes you think that any ailments that you might suffer from today are connected back to those radiation treatments, radiation experiments?

Mr. FROSINI. The breakdown of my immune system, indicated by the allergies, the diabetes and other ailments that I have suffered throughout the years. It may have been a prescribed procedure, medical procedure at that time. However, the question is, why was it soon discontinued? Why was it stopped after so many years of this treatment being subjected to the Army Air Corps?

Mr. BRYANT. Mr. Gamble, how long after the LSD tests that you took or that were administered to you did the symptoms that you described begin to occur?

Mr. GAMBLE. Shortly after I left Maryland and arrived back to Dover, DE, I noticed that I was very easily depressed.

Mr. BRYANT. Now, eventually your symptoms went away; is that correct?

Mr. GAMBLE. Yes; I would say roughly in 1960, 1961, in that neighborhood.

Mr. BRYANT. How many years would that have been?

Mr. GAMBLE. 1957 to 1960, 1961.

Mr. BRYANT. What do you think accounts for your symptoms disappearing?

Mr. GAMBLE. The LSD, after consuming it, there are periods of flashbacks and at that time you go into a very depressive stage. And normally I would take off to be by myself for a day or two, or however long it lasted.

Mr. BRYANT. OK. I have no further questions.

Mr. Gekas.

Mr. GEKAS. Yes; I thank the Chair. We said at the outset that this committee has had a large body of testimony in past years, at least the last three terms that I know of from individual cases like some of the anecdotes that you have presented to us, and that we have dealt timely and fully with those requests for some type of compensation. The question now arises, Mr. Gamble, we in our committee did determine or hear from you, did we not in your individual case?

Mr. GAMBLE. I never had the opportunity to testify before the committee——

Mr. GEKAS. No, not you, but your case came before us.

Mr. GAMBLE. Yes; my case came forward.

Mr. GEKAS. And you, too, Mr. Schnurman, is that correct?

Mr. SCHNURMAN. Yes. My situation goes back when I had to file suit against the Government.

Mr. GEKAS. Federal Torts Claim Act?

Mr. SCHNURMAN. In order for the Government to produce additional information that confirmed my exposure to these vesicant agents.

Mr. GEKAS. I understand. The question continues, did our committee eventually consider your claim?

Mr. SCHNURMAN. Yes, sir, you did.

Mr. GEKAS. That is what I thought. This supposes a larger question for it; that is why I am bringing it out for this panel, that in a way what you have done in bringing this—your situations to our committee before is to lay the groundwork for the larger task that is now ahead of us to bring in the entire class of American citizens who became victims of experimentation. So you have already succeeded in perhaps an invisible way in creating an atmosphere of reinquiry into these matters that have affected so many of our fellow citizens.

So we no doubt will be in one way or another folding in your cases to the larger portfolio that we are going to be developing as we move along, so we urge you to remain in contact with us.

I have no further questions.

Mr. BRYANT. Mr. Mann.

Mr. MANN. First of all, I want to thank each of you for being here today. I feel a sense of outrage at the experience that you had at the hands of the country that you served. I spent 4 years in the Navy myself some time ago and often I ended up doing things I didn't understand and without a full explanation of why, but there was always a basic assumption that my CO and that my country had my best interests at heart and I would not be asked to do anything that would unnecessarily risk me or my health. I cannot fathom the sense of violation that you must feel as you have come to understand over the years that that basic bond of trust was broken. And your testimony is very powerful indeed.

I had one question for you, Mr. Frosini. By what process was the radiation applied to you? Was this a machine or what?

Mr. FROSINI. There were two needles 8 inches long which contained capsules of radium, and each needle was inserted into each nostril. I laid on a table. There was a precise timing device. The person who applied the needles into my nostrils would activate the device similar to that of a chess game; the timing was exactly precisely 8½ minutes. He left the room and returned immediately at the ring of the bell and removed the needles. These needles contained—were left in my nostrils precisely 8½ minutes. I laid on a table in a room alone at three different occasions.

Mr. MANN. Thank you, sir.

Mr. GEKAS. Would the gentleman yield for just a moment?

Mr. MANN. Yes.

Mr. GEKAS. Are you talking about needles that penetrated your skin?

Mr. FROSINI. No. No. Eight-inch needles with capsules at the end which contained radium and each one was inserted in each nostril.

Mr. GEKAS. Not penetrating your skin, though.

Mr. FROSINI. Not skin invasive.

Mr. MANN. Nasopharyngeal. Thank you.

Mr. BRYANT. On behalf of this panel—Mr. Goodlatte, excuse me.

Mr. GOODLATTE. Thank you, Mr. Chairman.

I, too, appreciate all of you coming and testifying today, and what you say certainly is very concerning because it goes well beyond the issue of whether some of this might have been done for legitimate scientific purposes. What you have described are inhumane treatments.

Mr. Schnurman, I am particularly interested in what you had to say. You say you were left out in the snow? That is when you came to after this last dose?

Mr. SCHNURMAN. Yes.

Mr. GOODLATTE. Last exposure. Do you know who the other people that were participating in this were?

Mr. SCHNURMAN. Had no idea. We were all strangers to each other. We were directed not to speak to each other. And you know the size of a quonset hut with only seven of us in there, put your cot anywhere you wish, but put this clothing on in the morning, "this summer clothing."

Mr. GOODLATTE. You left without any identification of who else was there?

Mr. SCHNURMAN. Absolutely. I had no idea who they were or where they were going. I asked, should I return here? No.

Mr. GOODLATTE. Is it your opinion that you were left out in the snow because they thought you were indeed dead?

Mr. SCHNURMAN. Yes, indeed, sir.

Mr. GOODLATTE. What was the first time that you made any contact with your commanding officer or whoever with regard to how you had been treated?

Mr. SCHNURMAN. No sir; I never made any reference to it. That was under orders. There was no oath. It was strictly orders. If we spoke about or revealed any information about that, we would be charged with treason.

Mr. GOODLATTE. So when did you first bring it up with anybody, then?

Mr. SCHNURMAN. In 1974–75, with my doctor, a former naval medical officer. And when he asked, son, were you ever exposed to any chemicals, I said, no, sir. When I came out of the service I was an accountant. I am an accountant. I said—he said, Well, were you ever in any special experiments? And with that, it rang a bell and brought out the nightmares that have been present in—prior to and ever since that no person should ever have to go through.

Mr. GOODLATTE. Thank you, Mr. Chairman.

Mr. BRYANT. We would like to thank each of you. You traveled a long way and came a long way to help us understand this part of our history and we are very grateful to you.

At this time, the next panel may come forward, consisting of Robert Nordhaus, General Counsel, Department of Energy; Frank Hunger, Assistant Attorney General, Civil Division, Department of Justice; and Dr. Donald A. Henderson, Deputy Assistant Secretary for Health, Department of Health and Human Services.

Our first witness on this panel will be Mr. Robert Nordhaus. We welcome you and invite you to begin your testimony.

STATEMENT OF ROBERT R. NORDHAUS, GENERAL COUNSEL, U.S. DEPARTMENT OF ENERGY

Mr. NORDHAUS. Mr. Chairman, I am Robert Nordhaus, general counsel for the Department of Energy.

The three witnesses who preceded us have given the subcommittee testimony which I think shows how World War II and the cold war produced a series of medical experiments that to us, looking back on them anyway, are very troubling. And I think all of us in government now are quite concerned about learning the truth of what happened in that period, and if some of the subjects of these experiments were wronged—and it is pretty clear that some were—to take appropriate action to right the wrong.

What I would like to address is an issue that has come up which is not directly related as far as I can tell to two of the three experiments that were the subject of the earlier panel. That is the human radiation experiments that the Department of Energy's predecessor agencies, and other agencies of the Government, conducted over the last 50 years. And I would also like to give a brief summary of what the administration is doing to provide the public with a full accounting of these experiments and what it is doing to right any wrongs that may have been done to the subjects of the experiments.

The first of these experiments that we know of, on the basis of Congressman Markey's investigation of some 8 years ago, are the plutonium injection experiments that began in the mid-1940's. He identified some 30-odd additional experiments that were conducted by the predecessor agencies to the Department of Energy and other agencies of the Government, in the period leading up to the 1974 promulgation of human experimental guidelines by the then Department of Health, and it is now Health and Human Services, then Department of Health, Education, and Welfare.

When Secretary O'Leary learned about these experiments late last year, she directed the Department of Energy to do a full search of the records the department and its contractors had relating to these experiments, and to make the records public, consistent with privacy interests of the families and the subjects, and to inform the individuals involved of what happened and the need for any medical followup. The Department is in the process of doing that now.

It became evident as the information came out about these experiments that there were agencies other than the predecessor agencies for the Department of Energy that were involved. The President established a human radiation interagency working group to coordinate the governmentwide efforts to uncover the information about these experiments, to make it public, to inform the subjects, and to formulate an appropriate response to any who may have been harmed by those experiments.

The interagency working group has started its work. It has been working since January 3. The President has also established an independent advisory committee on human radiation experiments to review the history of these experiments and to determine whether the experiments were consistent with the then applicable ethical and scientific standards for human experiments and also whether they are consistent with current standards.

The advisory committee has been asked to make an interim report at 6 months, and if it is feasible to do so, a final report within a year. The information and the report that the advisory committee produces and the information and analysis of the interagency working group I think will provide the information necessary for the next step of the process, which is to determine what the appropriate governmental response will be, whether it is to be medical followup, compensation, or apology.

There are a wide range of possible responses. We have a number of models to look to that are detailed in my testimony and Mr. Hunger's and in that of some of the other witnesses.

I think at this point I would like to ask Frank Hunger—unless there are questions from members, I would go to the next part of the presentation.

[The prepared statement of Mr. Nordhaus follows:]

STATEMENT OF ROBERT R. NORDHAUS

GENERAL COUNSEL, U.S. DEPARTMENT OF ENERGY

BEFORE THE SUBCOMMITTEE ON ADMINISTRATIVE LAW AND
GOVERNMENTAL RELATIONS OF THE COMMITTEE ON THE
JUDICIARY, U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 2, 1994

Mr. Chairman and Members of the Committee:

I am pleased to appear before you today to discuss the position of the Department of Energy on the subject of human radiation experiments, and the major initiatives now underway by the Clinton Administration to provide full public disclosure and an independent review of the ethical and scientific propriety of such experiments.

Human radiation experimentation during the Cold War and predates adoption of the strict standards now in place that protect human research subjects. The Department of Energy and the Clinton Administration are committed to retrieving all relevant records so that this story can be fully told through reviewing and disclosing the circumstances and consequences of these experiments, in order to ensure that participants and their families are given complete information, and to remedy any wrongs that may have been committed.

President Clinton's Commitment to Openness in Government

This Administration recognizes that public trust can only be achieved if American citizens believe that their government is open, truthful, and accountable. President Clinton is committed to an open and responsive government. The openness initiative that the Secretary of Energy began at the Department of Energy last spring was a direct outgrowth of this commitment.

The Department of Energy's Openness Initiative

On December 7, 1993, Secretary O'Leary released important information that had previously been classified, including data on previously unannounced nuclear tests and the locations and quantities of the United States weapons grade plutonium stockpile. During the press conference in which she released this information, the Secretary described an experiment sponsored by the Army and the Atomic Energy Commission in the 1940's in which 18 persons were injected with plutonium. The records currently available suggest that some of these subjects may not have been fully informed of the purpose or risks of the experiments. This experiment and a number of others had been revealed by a 1986 report by the House Energy Conservation and Power Subcommittee of the House Energy and Commerce Committee.

We do not yet know whether the radiation experiments that were described in the 1986 House Subcommittee report, the experiments involving deliberate environmental releases that were discussed in the General Accounting Office Report prepared for the Senate Committee on Government Operations in December, 1993, and the experiments referred to in recent press accounts, comprise the universe of experiments that might be subject to questions of scientific and ethical propriety.

The Secretary of Energy is taking action to assure that a thorough and comprehensive records search is conducted by the Department of Energy and its contractors. The Department is committed to tell the full story. To that end, we have developed an action plan to expedite the identification, retrieval, management, declassification, and dissemination of information regarding human radiation experiments. Department of Energy personnel have been directed to cease routine and non-routine destruction of documents and to identify all pertinent records and information in the Department's possession and in the possession of our laboratories and contractors.

The Department's goal is to get all the facts out. All pertinent information that is found regarding human experimentation will be declassified as necessary on an expedited basis and permanently preserved for public review in an appropriate public archive. At the same time, the Department is taking steps to protect the privacy of people who were the subjects of experiments, as well as their families.

Issues Raised by the Human Experiments

From what we know thus far, human experiments involving ionizing radiation conducted or sponsored by the Department of Energy's predecessor agencies appear to fall into four categories:

1. Experiments designed to investigate the effects of radiation on humans or the way the human body metabolizes radioactive substances;
2. Experiments using radioisotopes as tools to study the biochemistry of normal metabolic processes;
3. Experiments designed to investigate the therapeutic uses of radiation in the treatment of diseases such as cancer; and
4. Experiments involving intentional releases of radiation to the environment for purposes of assessing the

behavior of such releases.

The radiation experiments that have come to light raise a number of questions. It is not clear that all subjects were properly informed of the purposes or risks associated with the experiments in which they were participants. Some of the experiments also raise questions about how the experimental subjects were selected. There is, at least on first inspection, the appearance of a pattern of choosing subjects from relatively vulnerable populations such as members of minority groups, poor people, prisoners, and retarded children.

Further disclosure and investigation of the facts surrounding these human experiments will enable the public, the Department, and other observers to get beyond first impressions.

Current Experiments Involving Human Subjects

The Department of Energy is funding approximately 200 experiments, and providing facilities for another 100 experiments involving human subjects. Not all of those experiments involve radiation, and the majority of those that do relate to nuclear medicine and involve the use of low tracer doses. In addition, none of these projects is classified.

As far as we have been able to ascertain, the Department is not conducting or supporting any experiments that would violate medical or ethical standards, or the Nuremburg code. All Department of Energy experiments are, we believe, in compliance with the Federal Policy on Protection of Human Subjects. The Department of Energy assisted in drafting this Federal Policy during the 1980's and adopted it along with 17 other Federal agencies in July 1991, when the rulemaking process was complete.

Human Radiation Interagency Working Group

On January 3, 1994, the President established a Human Radiation Interagency Working Group, consisting of the agency heads of the Department of Energy, Department of Defense, Department of Health and Human Services, Central Intelligence Agency, Department of Veteran Affairs, Department of Justice, National Aeronautics and Space Administration, and the Office of Management and Budget. The Group formed several Subcommittees, including a Legal Issues Subcommittee which will examine, among other questions, compensation and other federal responses to individuals who were the subjects of human radiation experiments and/or their families.

On January 18, the President established an independent Advisory Committee on Human Radiation Experiments, consisting of non-governmental experts in the fields of ethics, science, medicine, and law. The President has announced his intent to designate Dr. Ruth Faden of Johns Hopkins as the Chair. The Advisory Committee will review records of experiments involving human exposure to ionizing radiation and will advise the President and the Interagency Working Group whether human radiation experiments sponsored or carried out by Federal agencies complied with then-existing and current ethical and scientific standards.

Specifically, the Advisory Committee will review:

1. Experiments on individuals involving ionizing radiation. This will not include common and routine clinical practices, such as established diagnosis and treatment methods, involving incidental exposures to ionizing radiation.

2. Experiments involving intentional environmental releases of radiation that were designed to test human health effects of ionizing radiation or to test the extent of human exposure to ionizing radiation.

The Advisory Committee will evaluate human radiation experiments conducted since 1944. Experiments undertaken after the 1974 issuance of Department of Health Education and Welfare biomedical research guidelines will be sampled to determine their priority for review. Further inquiry into such experiments conducted after 1974 will be pursued if warranted.

The Advisory Committee will also review the experiments described in the December 1993 report by the General Accounting Office concerning intentional releases of radiation into the environment. Those were: "the Green Run test," conducted in December 1949 in Hanford, Washington; two radiation warfare field experiments conducted at the Atomic Energy Commission's Oak Ridge office in 1948; tests conducted between 1949 and 1952 of radiation warfare ballistic dispersal devices at Dugway, Utah, site; and four atmospheric radiation-tracking tests in 1950 at Los Alamos, New Mexico.

The Administration's Human Radiation Interagency Working Group may, in addition, identify further experiments for review and evaluation by the Advisory Committee.

The Advisory Committee will make any recommendations it deems appropriate concerning the need to expand or amend federal guidelines governing human radiation experimentation to the Interagency Working Group, which will in turn make appropriate recommendations to the President.

If warranted to protect the health of the individuals who were the subjects of the experiments or their descendants, the Advisory Committee will advise any relevant agencies of any need for medical follow-up.

The Advisory Committee will issue a preliminary report to the Human Radiation Interagency Working Group in six months, and issue a final report in one year. The Interagency Working Group has been tasked with coordinating efforts by relevant Federal agencies to gather all pertinent information and make it available to the Advisory Committee, as well as to the public.

After considering the findings of the Advisory Committee, the Interagency Working Group will make recommendations to the President about an appropriate Federal response to human radiation experiments, including the question of compensation.

The Human Experiment Helpline and Correspondence

The Interagency Working Group has adopted the Department of Energy's toll-free telephone Helpline which is administered by the Department of Energy. The purpose of the Helpline is to aid us in identifying those persons who may have been affected by the activities in question. The number of calls to the Helpline has been overwhelming. The Department has received more than 15,000 calls since December 24, 1993 and conducted more than 10,000 interviews with callers. Approximately 45% of those interviewed are veterans who believed they have been exposed to radiation.

The majority of callers appear not to have been subjects of human radiation experiments. The calls reflect the concerns of people in every state and of all different backgrounds. The Department is requesting that callers provide additional written information that can be used to identify and locate documents related to these experiments.

In addition, we have received over 2,600 letters in the last few weeks. Over one fifth of the letters are from individuals or their relatives who believe that they may have been subjects of human experimentation and another fifth of the letters are from individuals who believe that they have been exposed to radiation while serving in the military or while living next to a government facility. The remaining letters express support, offer assistance, or request information on the nature of the Department's efforts.

Remedies for Individual Subjects of Experiments

If our review determines that American citizens were treated wrongfully by their government, we believe this Administration owes the American people a full accounting and, where justified, an attempt to right any wrong done to individuals.

In order to fully inform the individuals involved, to assess whether compensation or other action is appropriate, and to make an informed recommendation to Congress, the Administration intends to take the following action:

1. Information will be provided to subjects and their families as soon as it becomes available;

2. When required to protect the health of individuals, who were subjected to human radiation experiments, or their descendants, the government will notify the subjects, or their descendants, of any potential health risk or the need for medical follow up;

3. The Legal Issues Subcommittee is currently examining various models for appropriate federal responses, including those incorporated into other federal programs such as those used to respond to "downwinders," veterans exposed to radiation, and the Japanese-Americans interned in the U.S. during World War II. The range of federal responses under consideration include potential monetary compensation, medical follow-up, disclosure of detailed information, formal apologies or other recognition, and ongoing research, education, and information programs; and

4. The Administration will develop and transmit to the Congress specific recommendations for legislative and other action that may be appropriate once the Interagency Working Group and the Advisory Committee have completed their first phase of work. The Advisory

Committee's interim report is scheduled to be presented to the Administration's Interagency Working Group in six months.

Throughout all of this activity, the Administration will continue to work closely with the Congress.

Until the Advisory Committee issues its interim report, it will not be possible to make an informed evaluation of whether the subjects of experiments gave informed consent, whether they were injured and, accordingly, how to craft an appropriate remedial scheme. Evaluating whether and how to compensate individuals affected by human radiation experiments will not be simple. Many preliminary questions are raised by the diversity of the experiments under consideration, the level of information imparted to subjects and the consent given, and the uncertainty as to whether particular individuals or their descendants were physically injured by an experiment.

These are difficult questions that cannot be answered until we know more of the facts. However, the Interagency Working Group will be able to make an informed recommendation to the President respecting the need for legislation for compensation or other remedial action after it reviews the records retrieved by the agencies and the Advisory Committee's conclusions.

Model Remedial Programs

As I previously mentioned, a Subcommittee of the Interagency Working Group is collecting and reviewing information on legislative precedents for compensating individuals who were victims of prior government action. Specific models under review include:

1. The Radiation Exposure Compensation Act, 42 U.S.C. § 2210, which addresses "downwinders'" exposure to fallout from nuclear testing in specified counties in Utah, Nevada, and Arizona and uranium mine workers in Colorado, New Mexico, Arizona, Wyoming, and Utah.

2. Restitution for World War II internment of Japanese-Americans under 50 U.S.C. App. § 1989(a)-(b).

3. Black lung benefits to coal miners under 30 U.S.C. § 901.

4. Veterans' compensation benefits under the Veteran's Dioxin and Radiation Exposure Compensation Act, P.L. 98-542, and the Radiation Exposed Veterans' Compensation Act, 38 U.S.C. 1112C

5. The Agent Orange Act of 1991, P.L. 102-4.

6. The Compact of Free Association and related agreements between the United States and the Government of the Marshall Islands, which address compensation and other relief for U.S. government testing of nuclear weapons in the Pacific.

7. Section 3162 of the National Defense Authorization Act for Fiscal Year 1993, which addresses health monitoring for past and present workers at Department of Energy sites.

Contained in Appendix A is a brief description of two of these model remedial programs, which, in conjunction with other agencies, are administered by the Department. The first involves medical monitoring of employees at Department of Energy sites, and the second involves compensation to and medical surveillance of individuals living in the Marshall Islands.

Conclusion

This concludes my prepared statement. I would be pleased to respond to any questions you and the Committee may have.

Appendix A

Medical Surveillance Program of Workers at Departmental sites

The Department of Energy monitors all current workers at its sites for health hazards identified by the Occupational Safety and Health Administration, such as lead, radiation, asbestos, and noise. In addition to the ongoing program, section 3162 of the National Defense Authorization Act for Fiscal Year 1993 requires the Secretary of Energy to establish and carry out a program for the identification and medical evaluation of current and former employees who are subject to significant health risks, as a result of their exposure of such employees to hazardous or radioactive substances during their employment at Department of Energy facilities. Funding for this initiative has not yet been appropriated. In the interim, the Department is using a phased approach to implement this program while fully utilizing existing resources. For example, the Department already has a number of associated medical surveillance programs underway, such as the beryllium worker monitoring program, to significantly improve monitoring of current and former workers previously exposed to hazardous materials. The Department has also initiated a program to identify systematically hazards and exposures in the workplace.

In addition, pursuant to the National Defense Authorization Act, the Department has established four pilot sites to test the criteria for establishing a Department-wide data base for clinical information relevant to medical monitoring for all health hazards of workers. It has selected as pilot sites the

Brookhaven National Laboratory in New York, Morgantown Energy Technology Center in West Virginia, Rocky Flats Plant in Colorado, and the Allied Signal site in Missouri.

Marshall Islands

Another remedial scheme under existing law is that for those affected by the nuclear testing program conducted in the Marshall Islands by the United States government during the period 1946 to 1958. The Compact of Free Association and related agreements provides for surveillance and associated health care to those who may have been adversely affected by the testing in the Marshall Islands.

In fulfillment of this commitment, twice a year the Department of Energy's Brookhaven National Laboratory sends a medial team and support personnel to visits the islands of Mejatto, Utrik, Ebeye and Majuro to provide medical surveillance to the exposed and unexposed cohorts. The medical team is composed of Brookhaven National Laboratory and Department of Energy personnel, staff of the Marshallese Government Health Services and volunteer physicians from various medical schools in the United States. The examinations are performed during the medical visits for specific medical conditions associated with radiation exposure.

Exposed individuals are transferred to Straub Clinic in Honolulu at U.S. Government expense when they are determined to have possible diseases that could be related to radiation exposure and are in need of diagnostic tests that cannot be performed on the Islands or in need of tertiary medical care for their condition. In Fiscal Year 1993, 12 people were referred to Hawaii.

In addition to the medical monitoring and treatment program described above, an agreement to implement section 177 of the Compact of Free Association established an independent Claim Tribunal to adjudicate medical damage claims and land damage claims. The Tribunal specified that certain medical conditions could be presumed to be the result of the nuclear testing. In order to receive compensation, the individual must be one of the exposed population and have medical documentation for one or more of the specified medical conditions. Awards may vary from $10,000 to $125,000, based on the seriousness of the medical condition. The Tribunal has been making awards for the last three years.

SUMMARY OF ROBERT R. NORDHAUS' TESTIMONY ON HUMAN RADIATION EXPERIMENTATION

February 2, 1994

The Clinton Administration and the Department of Energy are determined to disclose all records of human radiation experiments. In order to disclose all relevant information, the Department has developed an action plan to expedite the identification, retrieval and management, declassification, and dissemination of records regarding human radiation experiments.

Our current search has unearthed four categories of human radiation experiments conducted or sponsored by the Department: (1) those designed to test the effects of radiation on humans or the way the body metabolizes radioactive substances; (2) those using radioisotopes as tools to clarify normal metabolic process; (3) those designed to test the therapeutic uses of radiation in the treatment of diseases such as cancer; and (4) those involving intentional releases of radiation to the environment for purposes of assessing their military application and implications.

The President has convened a Human Radiation Interagency Working Group to coordinate efforts by involved agencies to retrieve and review records of human radiation experiments. He has also established an Advisory Committee, funded by the Department of Energy, to be staffed by non-governmental experts in the fields of ethics, science, medicine, and law. The Advisory Committee will advise the President whether these experiments complied with current and then-existing scientific and ethical standards (including those of informed consent), whether current standards adequately protect human subjects, and whether the involved agency should notify subjects or their descendants of health risks and the need for medical follow up. The Advisory Committee will issue an interim report in six months and a final report in a year.

If our review determines that American citizens were treated wrongfully by their government, we believe this Administration owes the American people a full accounting and, where justified, an attempt to right any wrong done to individuals. In addition to working with the Interagency Working Group, the Department will continue to take the following actions:

(a) administer the Interagency Working Group's toll-free helpline to identify those who may have been the subjects of experiments and, when appropriate, direct callers to the appropriate federal agency;

(b) locate information and provide it to subjects and their families and, if necessary, notify subjects or their families of any potential health risks or the need for medical follow-up;

(c) disclose all information to the public consistent with the privacy interest of the subjects and their families.

Mr. BRYANT. Mr. Hunger, we welcome you and ask you to begin your testimony.

STATEMENT OF FRANK W. HUNGER, ASSISTANT ATTORNEY GENERAL, CIVIL DIVISION, U.S. DEPARTMENT OF JUSTICE

Mr. HUNGER. Thank you, Mr. Chairman and members of the subcommittee.

I am most pleased to appear before you today to inform you of the role that the Department of Justice has played in the administration's initiative toward a full and open examination of the nature, extent, and effects of the government conducted or sponsored human radiation experiments.

My colleague from the Department of Energy, Mr. Robert Nordhaus, has described to you in some detail the work of the interagency working group. My written testimony provides further detail on this subject.

Let me just simply emphasize that the Department of Justice shares the commitment to a full public accounting of the Government's human radiation experiments. The Department of Justice and a subcommittee of the working group are charged with developing a broad range of possible responses to individuals who have been affected by human radiation experiments.

Until the facts are revealed and reviewed, it is really impractical at this point in time for us to fashion or suggest to you a fair and comprehensive response. Depending upon the outcome of the working group's investigation, the range of responses may include informing subjects and their families of potential health risks and the need for medical followup; monetary compensation; formal apologies; and an ongoing research information and education program.

The Department of Justice has worked closely with other agencies to ensure that procedures for record review and retrieval will be carried out promptly while at the same time not sacrificing the personal privacy interests of the involved individuals.

Our counsel on matters involving the Privacy Act and the Freedom of Information Act has been offered in the spirit of the administration's commitment to make public the greatest amount of information at the earliest possible time. Once details of the experiments are made public, and judgments given on the propriety of these experiments, the working group plans to make recommendations to the President and this Congress.

I cannot, however, overemphasize that until the information is collected and analyzed it would be premature to predict the form of an appropriate response. I, therefore, urge you to give us an opportunity to complete the review and analyze the material so that any proposals made are made upon the fullest information possible. This ensures that our response as a nation is both comprehensive and fair.

There are three compensation programs which have been enacted by Congress and are administered by the Department of Justice which you may find offer some guide to you during your deliberations. These include the Radiation Exposure Compensation Act, the National Vaccine Injury Compensation Program and the Civil Liberties Act of 1988, which provided compensation to Japanese-Americans who were relocated during World War II.

I will be glad to respond to the best of my ability to any inquiry you may have about these programs, how they are administered, the results we have seen from them, and their overall success in compensating injured persons.

Each of these programs, RECA, the National Vaccine Injury Compensation Program and the compensation program for Japanese-Americans relocated during World War II, were carefully designed and tailored to provide efficient appropriate compensation for persons who sustained damages as a result of the conduct of the United States. Great attention was paid to designating a recipient population, setting eligibility standards, assessing the availability of relevant information, and determining the propriety of monetary and other forms of relief.

At this time, we simply do not have sufficient information with regard to the subject of human radiation experiments to make a specific proposal to you. The human radiation interagency working group and the independent human radiation advisory committee are dedicated to developing a record so that the administration and this Congress, should it choose, can craft an informed and appropriate response to a program which has too long been ignored.

Thank you, sir.

[The prepared statement of Mr. Hunger follows:]

Department of Justice

STATEMENT

OF

FRANK W. HUNGER

ASSISTANT ATTORNEY GENERAL

CIVIL DIVISION

BEFORE THE

SUBCOMMITTEE ON ADMINISTRATIVE LAW

AND GOVERNMENTAL RELATIONS

COMMITTEE ON THE JUDICIARY

U.S. HOUSE OF REPRESENTATIVES

CONCERNING

GOVERNMENT-SPONSORED RADIATION TESTS ON HUMANS AND POSSIBLE COMPENSATION FOR PERSONS HARMED IN THE TESTS

PRESENTED ON

FEBRUARY 2, 1994

Mr. Chairman and Members of the Subcommittee:

I am pleased to appear before you today to discuss the role of the Department of Justice in connection with the Administration's commitment to a full and open examination of the nature, extent, and effects of government conducted or sponsored human radiation experiments involving intentional exposure to ionizing radiation.

The Department of Justice has been an active, full-time partner in the Human Radiation Interagency Working Group since the inception of that group on January 3, 1994. Together with the Departments of Energy, Defense, Health and Human Services, and Veterans Affairs, and the National Aeronautics and Space Administration, the Central Intelligence Agency, and the Office of Management and Budget, the Department of Justice shares a commitment to a full and public accounting of the government's human radiation experiments during the past fifty years.

The Interagency Working Group will conduct an investigation of human radiation experiments conducted by or on behalf of the government since 1944, with particular emphasis on experiments conducted prior to May 30, 1974, the date of issuance of the Department of Health, Education, and Welfare Regulations for the Protection of Human Subjects (45 C.F.R. 46). The focus of the investigation will be on experiments on individuals involving intentional exposure to ionizing radiation (excluding common and routine clinical practices) and experiments involving intentional environmental releases of radiation that were designed to test human health effects of, or the extent of human exposure to, ionizing radiation. In addition, the investigation will examine certain radiation experiments that were noted in the December 1993 report by the General Accounting Office (These experiments generally involved atmospheric releases that were not intended to test human exposure. However, their potential effect on humans will be studied by the Interagency Working Group). Further inquiry into other radiation experiments may be undertaken if warranted.

The task of the Interagency Working Group is to conduct an open and thorough investigation of Cold War-era government sponsored human radiation experiments. The group will coordinate a government-wide effort to uncover the nature and extent of such experiments, to seek answers to questions of whether medical follow-up to the experiments is warranted, and whether compensation or other assistance to those subjected to experiments may be appropriate.

The Interagency Working Group has established five subcommittees to address specific subject issues: Public Information and Communications; Retrieval and Review of Records; Ethical and Scientific Standards; Congressional Relations; and Legal Issues. Representatives of the Department of Justice have participated in the work of these subcommittees to begin the arduous task of documenting, analyzing, and making public the details of experiments conducted since the onset of the Cold War era.

In the relatively brief span of time since the Interagency Working Group undertook its task, substantial progress has been made in developing mechanisms to gather maximum information from outside and within the government on the nature and extent of human radiation experiments, to preserve that information for deliberate and thorough investigation, and to make the information public to the fullest extent possible while protecting the privacy of the individuals involved.

Through its communications and outreach subcommittee, the Interagency Working Group has developed guidelines for collection of information from the general public concerning incidents and details of human radiation experiments. Information collected through these efforts will be pursued by the Interagency Working Group and compared with information in the files and records of federal agencies to capture the greatest amount of information on the extent of human radiation experiments.

In consultation with the Record Retrieval and Inventory subcommittee, each of the federal agencies that may have conducted or sponsored human radiation experiments has already taken steps to notify its components, as well as outside entities that conducted such experiments under agency contract or grant, to locate and preserve records of human radiation experiments and to coordinate the retrieval and inventory of such records for further investigation. The Department of Justice has consulted with our partners in the Interagency Working Group to ensure that consistent procedures are employed at each agency and that the scope of these record searches will be comprehensive.

The investigation of human radiation experiments will not be restricted to the government's internal resources. The Interagency Working Group's Ethical and Scientific Standards subcommittee, in which the Department of Justice has participated, offered advice and counsel to the working group on the establishment of a body of citizens from outside the government to assist the working group through independent review of the ethical and scientific standards by which the experiments will be evaluated. To that end, on January 18, 1994, the President signed an Executive Order forming an Advisory Committee on Human Radiation Experiments, to be made up of private citizens, including experts in ethics, medicine, science, and law, that will afford independent advice and recommendations to the Interagency Working Group concerning human radiation experiments. The Advisory Committee will determine the ethical and scientific standards and criteria by which it will evaluate the experiments and the extent to which the experiments were consistent with applicable standards. If required to protect the health of individuals who were subjects of experiments or their descendants, the Advisory Committee may recommend that particular subjects of an experiment, or their descendants, be notified of any potential health risk or the need for medical follow-up. The Advisory Committee may recommend further policies, as needed, to ensure compliance with recommended ethical and scientific standards for human radiation experiments.

In compliance with the Federal Advisory Committee Act, as amended (5 U.S.C. App. 2), the meetings of the Advisory Committee on Human Radiation Experiments will be open to the public except as to discussions of individual subjects or their records. Such discussions will be closed to protect personal privacy interests. Six months from the filing date of the Advisory Committee's charter, the Advisory Committee will issue an interim report stating whether it anticipates fulfilling its duties within a one-year time frame.

These measures constitute a major initiative on the part of the government to develop a clear and credible record concerning the nature, extent, and effects of human radiation experiments, and to answer questions of whether the experiments comported with applicable ethical and scientific standards. The Interagency Working Group has also undertaken the task of developing recommendations for appropriate responses to those who were affected by these experiments.

The Department believes that if the Administration and Congress determine that relief is warranted after a review of the facts, legislative action by Congress may be necessary to provide for an appropriate federal response. However, I want to emphasize that whether legislation is needed and what the nature of any such legislative proposal would be are questions that must await full development of the facts and details concerning the nature, extent, and effects of human radiation experiments.

The Interagency Working Group's Legal Issues subcommittee is working to develop a broad range of potential responses to individuals affected by human radiation experiments including the following:

1. Taking immediate action to provide information to subjects and their families;

2. Notifying particular subjects of human radiation experiments, or their descendants, of any potential health risk or the need for medical follow-up when required to protect the health of individuals.

3. Examining various models for appropriate federal responses, including those incorporated into other federal programs, such as those for "downwinders," Veterans exposed to radiation, and the Japanese-ancestry interns during World War II. The range of

federal responses under consideration include potential monetary compensation, medical follow-up, disclosure of detailed information, formal apologies or other recognition, and on-going research, education and information programs; and

4. Developing specific recommendations for legislative and other action that may be appropriate once the Working Group and Advisory Committee have completed at least their first phase of work and the interim report is issued.

The Department of Justice has played a unique role in the work of the Human Radiation Interagency Working Group. We have offered legal advice and counsel on a broad range of issues that have arisen in the Working Group's subcommittees since the first week of this year.

We worked closely with our fellow agencies to ensure that procedures for record review and retrieval will be carried out promptly, yet with no sacrifice of the personal privacy interests of individuals subjected to human radiation experiments. Our counsel on matters implicating the Privacy Act and the Freedom of Information Act has been offered in the spirit of the Administration's commitment to making public the greatest amount of information at the earliest possible time while still shielding experiment subjects and their families from embarrassing public exposure in matters of personal privacy.

We have worked to ensure that the mission of the independent Advisory Committee on Human Radiation Experiments is clear and that its membership includes a broad range of experts and persons of varying perspectives. Of primary concern to all of us was that its members be of the highest personal and professional qualifications and devoid of any vested interest or conflict of interest in connection with the crucial role they will play in evaluating the experiments and in making their recommendations.

We have given great attention to ensuring that the investigation entrusted to this interagency working group is comprehensive, that the integrity of records of experiments will be preserved, and that all of the facts will be developed without predisposition as to where those facts should lead us.

This is an opportunity for full and open disclosure of information that has been hidden away or ignored for too long. Once the details of what happened have been made public and judgments can be rendered on the propriety of these experiments, we will join our fellow members or the Working Group in making recommendations to the President and the Congress regarding an appropriate response to those citizens subjected to the experiments, to their families, and to the American people.

Throughout all of this activity, the Administration will continue active consultations with the Congress. However, I want to emphasize that until the information is collected and analyzed, it would be premature to predict the form of response which will be most appropriate. The Administration has demonstrated its commitment to the subjects of radiation experimentation, and I would urge the Congress to give us an opportunity to complete the review and analysis process so that any legislative proposals can be structured on the basis of the fullest information possible to ensure that our response as a nation is fair.

The Administration is moving forward on all aspects of this important issue, including reviewing many existing compensation programs as potential models for any legislative proposals that may be appropriate once the facts have been developed. The Interagency Working Group's Legal Issues subcommittee is studying various compensation plans, including several administered by the Department of Justice. Those programs are the Radiation Exposure Compensation Act, the National Vaccine Injury Compensation Program, and the Civil Liberties Act of 1988.

The Radiation Exposure Compensation Act

The Radiation Exposure Compensation Act, 42 U.S.C.A. § 2210 note (Supp. 1993), was enacted on October 15, 1990. The Act established an administrative program to provide lump sum compassionate payments to certain individuals, or their survivors, who contracted specified cancers and nonmalignant respiratory diseases as a result of either their exposure to radiation released during above-ground nuclear weapons tests or their exposure to radiation during employment underground in uranium mines. The procedures established in the implementing regulations are designed to utilize existing records so that claims can be resolved in a reliable, objective, and non-adversarial manner, quickly and with limited administrative costs to the United States or to the person filing the claim.

There are three basic categories of eligible claimants: Downwinders, Onsite Participants, and Uranium Miners. Claimants in each of these categories must meet two major criteria and, depending on the type of disease, several minor criteria in order to establish their eligibility to receive a compensation payment.

"Downwinders" are individuals who were exposed to fallout from atmospheric nuclear weapons testing while residing in certain statutorily designated areas in Utah, Nevada, and Arizona. In order to be eligible for the lump sum compensation payment of $50,000.00, these individuals must establish that they resided in the area affected by fallout for the required length of time, and subsequently developed one of thirteen statutorily specified cancers.

"Onsite Participants" are individuals who participated onsite in a test involving the atmospheric detonation of a nuclear device. In order to be eligible for the lump sum compensation payment of

$75,000.00, these individuals must establish that they participated onsite in the atmospheric detonation of a nuclear device, and subsequently developed one of the thirteen specified cancers.

"Uranium Miners" are individuals who were employed underground in uranium mines in Utah, Colorado, Arizona, New Mexico and Wyoming between 1947 and 1971. In order to be eligible for the lump sum compensation payment of $100,000.00, these individuals must establish that they were exposed to certain levels of radiation while working in the mines, and subsequently developed lung cancer or one of four statutorily designated nonmalignant respiratory diseases.

The regulations implementing the Radiation Exposure Compensation Program were published in the Federal Register on April 10, 1992. The first claims were received on April 1, 1992, and paid on May 11, 1992. Between April 1, 1992 and January 26, 1994, the Department of Justice has received 3,595 claims. Of those, 1,570 claims have been approved for payment for a total amount in excess of $112.5 million dollars. Denied claims total 1,493, and only 532 are pending resolution.

A recent Department of Justice Inspector General's report concluded that the Radiation Exposure Compensation Program was "well managed" and that "Government funds were properly expended for the purposes intended by the [Act]."

The National Vaccine Injury Compensation Program

The National Vaccine Injury Compensation Program has been operating for more than five years and has largely accomplished the goals it was set up to achieve. The Program is available to compensate persons who believe they have been injured by receiving one of the standard vaccines administered in childhood. The purpose of the Program is to provide compensation in an equitable manner for persons who suffer vaccine-related injuries, while simultaneously insulating vaccine manufacturers from unpredictable liability in the civil justice system. The end result is a stable supply of critical vaccines.

Claims are resolved in the United States Court of Federal Claims, where the Justice Department represents the Secretary of Health and Human Services, the statutory administrator of the Program. Whether to pay a particular claim -- and how much is appropriate -- is determined by experienced special masters whose exclusive function on the court is to make these determinations.

Although lawyers are involved on both sides, proceedings under the Vaccine Program are less adversarial than traditional tort litigation. The resolution process is less formal, less costly, and moves more quickly than a typical lawsuit once the Secretary's position on a particular claim is made known to the court. To succeed, the process depends upon cooperation between the claimant and the Secretary. However, the resolution process frequently includes hearings where fact and expert testimony is presented by both sides.

Since the Program started accepting claims in October of 1988, more than 1700 claims have been resolved. More than 500 of those claims were decided in favor of the claimant, resulting in awards between several hundred and several million dollars in compensation. As of the end of 1993, a total of more than $400 million has been paid under the Program. To the extent that the Program has had difficulty, it is largely because many more claims have been filed than were expected. Several thousand claims are at some stage of the resolution process, many have yet to be assigned to a special master. Due to the volume of claims and their complexity and the limited number of court personnel available to resolve vaccine claims, the pace of resolution has been somewhat slower than many people had hoped. Nevertheless, the basic goals of providing equitable compensation to persons who suffer vaccine-related injuries and ensuring a stable supply of critical vaccines have been achieved by the Vaccine Program.

The Office of Redress Administration

The Justice Department's Civil Rights Division administers a compensation program providing for monetary payments and additional services, pursuant to the Civil Liberties Act of 1988 (Public Law 100-383, codified at 50 U.S.C. App. Section 1989).

During World War II, approximately 120,000 Japanese Americans were interned, relocated or evacuated in the U.S. because of their race. Nearly fifty years later, the country apologized for this grave injustice. On August 10, 1988, the Civil Liberties Act of 1988 was signed into law, authorizing payment of $20,000 to each U.S. citizen or permanent resident alien of Japanese ancestry who meets the criteria for eligibility. The Act acknowledges the fundamental injustice of the internment and directs the Attorney General to identify, locate and distribute payment to each eligible individual, without requiring an application. The Act also provides for funding of a public education program to prevent the recurrence of any similar event in the future.

Of the original 120,000 persons interned or evacuated during the war, about 80,000 surviving individuals have received their redress payments. The 1988 Act and its 1992 amendments authorize $1.65 billion for redress payments, of which, not more than $500 million may be disbursed each fiscal year. The program will end in 1998 or when maximum program appropriations are expended, whichever occurs first.

The success of the redress program is due largely to superb research and outreach efforts utilized to identify and locate those who qualify under the Act. The task of identifying and accounting for 120,000 potential redress recipients required extensive research into historical and current information sources including

50-year-old camp rosters of the War Relocation Authority, and other government records retained by the National Archives and the Immigration and Naturalization Service.

Once a potential recipient's historical record is located, the Office of Redress Administration must then track down that person's current address or verify that the individual is deceased. This was accomplished through official sources such as the Social Security Administration and state vital statistics bureaus. Frequently, unofficial sources were utilized including relatives of potentially eligible individuals, civic associations and religious organizations.

Perhaps the most unique aspect of the redress program is that the responsibility of locating redress recipients is placed on the Attorney General. Though the Act makes provisions for accepting voluntary information from the public, it prohibits the Department from requiring internees to submit an application for redress. Specifically, the Act states that the Attorney General "shall, subject to availability of funds appropriated... encourage through a public awareness campaign, each eligible individual to submit his or her own current address..."

Rather than waiting for funding, the Office of Redress Administration began a public outreach campaign immediately. Soon after its opening, the Office opened six toll-free telephone lines to begin gathering information about potential redress recipients, receiving 1,724 calls in the first week. The Help Line proved to be a main source of communication between the Office of Redress Administration and redress recipients.

Since over 70 percent of redress recipients reside in California, contacting and educating this sector of the Japanese American community about the redress program was a priority for the Office of Redress Administration. On October 11, 1988, a temporary office opened in San Francisco. The office operated for 90 days, distributing and gathering information, publicizing the redress program and making contacts with the Japanese American community on the West Coast. As a result of the opening of the San Francisco office, extensive contacts were made with leaders of the Japanese American community. Outreach continued through public speaking engagements, community workshops, publication of informational materials, press releases and mailings. The Office of Redress Administration has conducted over 50 workshops within the Japanese American community, meeting individually with thousands of redress recipients to provide information and assistance with their cases. These outreach strategies have been an integral part of the philosophy of the Office of Redress Administration and have continued throughout the program. The Office of Redress Administration has also brought three groups of Japanese American community leaders to its office in Washington, D.C. to participate in a series of meetings and consultations which provide an 'inside view' of the program.

The outreach efforts and community work, in conjunction with the Office of Redress Administration's commitment to the redress effort, have made the redress program a success, fulfilling both the letter and the spirit of the redress law.

Each of these programs was carefully designed and tailored to provide efficient, appropriate compensation for the carefully defined injuries Congress intended to address. Great attention was paid to defining an appropriate recipient population, setting eligibility standards, assessing the availability of relevant evidence, and determining the propriety of monetary and other forms of compensation. We don't have any of that information with regard to the subjects of human radiation experiments at this time. The Human Radiation Interagency Working Group and the independent Human Radiation Advisory Committee are dedicated to developing a record on which the Administration can report to and work with the Congress in crafting the appropriate response the Nation deserves.

Mr. BRYANT. Thank you.

Dr. Henderson.

STATEMENT OF DR. DONALD A. HENDERSON, DEPUTY ASSISTANT SECRETARY FOR HEALTH-SCIENCE, U.S. PUBLIC HEALTH SERVICE, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Dr. HENDERSON. Thank you, Mr. Chairman. It is a pleasure for me to be here with you today representing the Department of Health and Human Services, which is of course working closely with the interagency task force.

I will say a word about certain of the activities that the Department is undertaking to identify experiments which were conducted or supported by the Department which involve human exposure to ionizing radiation. But before doing so I thought it would be helpful to you if I were to say a word about past actions which have been taken by the Department of Health and Human Services with respect to the protection of human subjects, because over the past 40 years a formal system has steadily evolved to assure that research involving human subjects fully takes into account both risks and benefits as well as consent which is voluntary, competent, and informed.

In brief, the situation today is quite different than pertained in the mid-1940's. The first Federal policy for the protection of human subjects was adopted and implemented as long ago as 1953 at the National Institutes of Health Clinical Center, and it established the pattern which has been elaborated on as time has passed. It was an important first step and it established the principle of what are called institutional review boards, which are now fundamental to the system of human subject protection throughout the world.

In 1966, fully 28 years ago, the Public Health Service issued a policy that required its grantees and contract recipients to undertake prior review of all research protocols involving human subjects for all research supported by the Public Health Service. Since the Public Health Service, as you know, funds an enormous amount of research in research institutions throughout the country and indeed throughout the world, this had a major impact indeed upon codifying, if you will, principles with regard to the protection of human subjects.

The policy required that several factors be weighed with regard to each research protocol. First, the benefits and risks to the individuals; second, the methods to be used to obtain informed consent; and finally, the rights and welfare of the research subjects. This action served to formalize a process which has gradually evolved in all of the institutions.

In the early 1970's there were several instances, events, including the Tuskegee episode, which led to a renewed interest in the protection of human subjects. As a result of this, a National Commission for the Protection of Human Subjects for Biomedical and Behavioral Research was established. That Commission operated over a 4-year period between 1974 and 1978. It issued a number of reports and recommendations regarding other principles for research involving pregnant women, fetuses, prisoners, children, and the mentally disabled.

The Commission also issued the Belmont report, as it is called, which deals with ethical principles and guidelines for the protection of human subjects of research. This landmark report provides guidance for distinguishing medical practice from research, and identifies three fundamental principles for the protection of human subjects: respect for persons, beneficence, and justice.

It was decided in 1974 to codify these policies as a regulation. This was published in 1974. As the National Commission continued its work, additional regulations were issued to cover specific groups of people. The regulations formally established the institutional review board as the foundation for the system of review of proposals for research involving subjects.

In 1991, the core of these regulations was adopted as a Federal policy the so-called common rule, which 16 Federal departments and agencies agreed upon. Activities in implementing the policy are coordinated by an interagency committee chaired by Dr. Gary Ellis of the Department of Health and Human Services.

I would like to say just a word about what the Department is now doing. A special committee has been established by the Secretary a memorandum has been sent to all Divisions requesting immediate identification of records.

We recognize that the task of identifying experiments and locating records will not be an easy one, and I think this is important to stress. For those experiments which have been conducted under the auspices of PHS employees, the records, if they still exist, should be found in the Federal files. But the Public Health Service supports research in a large number of institutions across the United States. It will be necessary to identify the institutions where research may have been conducted and to try to retrieve records in a great variety of different areas.

We will be pursuing multiple different leads to try to identify all possible instances in which human irradiation experiments have taken place. Obviously, our record of research and grant contract awards is one lead. We will be working cooperatively with other agencies to do a complete literature review of all reports because many the experiments are reported in the literature.

We will be following up on the 800-number calls of people reporting personal experiences. We will also be interviewing scientists who had been doing research between 1944 and 1974 for further leads. There will be a lot of detective work involved. It will not be an easy task, but we will be pursuing this with all dispatch.

In closing, I should like to note, Mr. Chairman, that on February 9, the Department's Office for the Protection from Research Risks celebrates its 29th year of continuous oversight. Protection is embodied in its charge and its responsibilities are designed specifically to preclude the very problems that we have gathered here today to address. It is a problem that is taken very seriously by the science community and I think the science community is doing a good job today in addressing those concerns.

Thank you.

[The prepared statement of Dr. Henderson follows:]

DEPARTMENT OF HEALTH & HUMAN SERVICES

Washington, D.C. 20201

Testimony of

Dr. Donald A. Henderson

Deputy Assistant Secretary for Health -- Science

U.S. Public Health Service

Before the

Subcommittee on Administrative Law

and Governmental Relations

Committee on the Judiciary

House of Representatives

February 2, 1994

Mr. Chairman and Members of the Committee:

I am Dr. D.A. Henderson, Deputy Assistant Secretary for Health-Science in the Department of Health and Human Services. Today I will describe the activities currently underway to identify all experimentation between 1944 and 1974 which was conducted or supported by HHS and which involved human exposure to ionizing radiation. Before doing so, I believe it would be helpful for me to briefly review the actions taken by HHS and its predecessor agency which, over the past 40 years, have evolved into a formal and well-codified administrative structure to assure that research involving human subjects fully takes into account both risks and benefits as well as consent which is voluntary, competent, and informed.

Today, all experiments involving human subjects whether conducted in PHS institutions or by grantees must be reviewed, approved and regularly monitored by a formally constituted Institutional Review Board (IRB).

Protection of Human Subjects Today

The evolution of requirements for the protection of human subjects begins in 1953 at the National Institutes of Health (NIH). At that time, the NIH Clinical Center produced the first U.S. Federal policy for the protection of human subjects. This policy and the committee that implemented it were an early step in the development of the research review mechanism, the institutional review board (IRB), that is now fundamental to the system of human subject protection throughout the United States. On February 9, 1966, the Public Health Service issued a policy that required prior review of research protocols involving human subjects in research supported by the PHS. It required several factors be carefully weighed; 1) the balance of benefits and risk to the individual; 2) methods used to obtain informed consent; and 3) the rights and welfare of the research subjects.

The Department of Health, Education, and Welfare (HEW), the predecessor to HHS, extended and formalized this policy as a regulation on May 30, 1974. The 1966 policy and the regulations that followed in 1974 were based on the concepts that freely given consent to participate in research is the cornerstone of ethical experimentation involving human subjects and that the risks of research need to be balanced against the benefits derived. The regulations established the Institutional Review Board (IRB) as the mechanism through which the adequacy of the informed consent process could be assessed and the rights and welfare of human subjects are otherwise protected.

In 1991, the core of the HHS regulations, further revised, was adopted as the Federal Policy for the Protection of Human Research Subjects. This Federal

Policy (HHS, 45 CFR 46, Subpart A), or so-called "Common Rule," was promulgated by the sixteen Federal departments and agencies, including those represented here today, that conduct, support, or otherwise regulate human subjects research. The Policy is designed to make uniform the human protection system in all relevant Federal departments. This Policy is a framework in which investigators, institutional review board members, and others can ensure that serious efforts are being made to protect the rights and welfare of research subjects. The regulations also hold researchers and IRBs publicly accountable for their decisions and actions.

The Department of Health and Human Services's Office for Protection from Research Risks (OPRR) oversees implementation of the Policy in all HHS facilities as well as domestic and foreign institutions or sites receiving HHS funds. OPRR requires that each HHS agency and extramural research institution that conducts or supports research involving human subjects sets forth the procedures it will use to protect human subjects in a policy statement called an "assurance of compliance."

This is a formal, written commitment (i) to widely held ethical principles, (ii) to the HHS regulations for the Protection of Human Subjects, and (iii) to institutional procedures adequate to safeguard the rights and welfare of human subjects. The terms of the institution's assurance are negotiated with OPRR.

OPRR has been in operation for over 20 years and is tasked with ensuring compliance with human subjects protection regulations. This office responds to allegations of noncompliance and actively pursues investigations.

It is now universally accepted that research investigators have a fundamental responsibility to safeguard the rights and welfare of the people participating in their research activities. In addition, it has been decided by law that an objective review of research activities involving human subjects by a diverse group of individuals is most likely to protect human subjects and promote ethically sound research. IRBs are generally composed of members with expertise in science, ethics and other nonscientific areas. This diversity fosters a comprehensive approach to safeguarding the rights and welfare of human subjects.

HHS Activities

Now I would like to briefly review the efforts we are currently undertaking as a part of the White House Human Radiation Interagency Working Group. HHS is actively participating in the Working Group as well as all of its subcommittees.

We have provided a memorandum to all HHS components which:

- asks each Departmental division to identify an individual who will be responsible for activities related to the Working Group,
- directs each Departmental division to begin immediately to identify records related to human experimental exposure to ionizing radiation, and
- directs each Departmental division to retain and secure any and all records that may pertain to experimental exposure of humans to ionizing radiation.

It is anticipated that most of the experiments funded by HHS involving human exposure to ionizing radiation were funded by the Public Health Service (PHS). Therefore, a PHS Human Radiation Studies Working Group has been established with representatives from the Office of the Assistant Secretary for Health, the National Institutes of Health, the Centers for Disease Control and Prevention, the Indian Health Service, and the Food and Drug Administration. This group will provide detailed guidance and oversight to the staff investigating radiation research.

Preliminary projections indicate that PHS research records will be found in many locations. For those experiments conducted by PHS employees, the records that exist are likely to be found within agency files. However, as you know, much of the research supported by the PHS is by research scientists at institutions located throughout the United States. Problematic experimentation, for reasons I have noted, most likely could have occurred prior to the mid 1960's, i.e. more than 30 years ago.

Identifying and locating the records of these grantees and contractors will require additional effort as the overwhelming majority of the records of special interest -- research protocols, documents related to informed consent, and identities of research subjects -- will be located at awardee institutions. Thus, while we are moving forward, the task is substantial and must be undertaken with considerable care. For example, we need to be concerned at every step of the way that we do not in anyway place the privacy interests of research subjects at risk.

We will be pursuing multiple leads in our efforts to identify human radiation experiments. First, we will be examining our own records of research and research grants and contracts. At the same time we will be working cooperatively with other agencies to conduct a comprehensive search of the scientific literature, follow up on calls coming in to the 800 number, and use all possible means to identify relevant experiments.

Finally, HHS is conducting an assessment of our expertise in providing follow-up to individuals who may have been exposed to radiation. NIH, in particular the National Cancer Institute, has conducted longitudinal studies on radiation exposure studies of Chernobyl victims, and follow-up studies of patients who have received radiation as a part of a treatment regimen. In addition, CDC has conducted studies of the human health effects of occupational and environmental exposure to radiation. Finally, since the early 1960s FDA has been monitoring the health effects of radiation exposure from fall out, occupational exposure and medical exposures.

Conclusion

Mr. Chairman, on February 9, this vigorous system of protecting human volunteers in research supported by HHS enters its 29th year of continuous oversight. In closing, we want to assure you that the protections in place are designed to preclude the very problems that we have gathered here today to discuss.

Mr. **BRYANT**. Thank you.

Dr. Henderson, I would like to ask you and also the other two witnesses as well if the 800 numbers that have been referred to here are turning up calls or reports with regard to testing other than radiation testing?

Dr. **HENDERSON**. I think that would be best answered by my colleague from Energy.

Mr. **BRYANT**. Yes.

Mr. **NORDHAUS**. There are a wide variety of calls. I think about 40 percent of them are veterans' calls relating to a wide range of concerns not at all limited to radiation testing. And I have Peter Brush here who is managing that process. We will supply details for the record. But as far as we can tell, it is less than well under 50 percent.

[The information follows:]

The Department of Energy Human Experimentation Hotline has talked to approximately 17,000 individuals and recorded almost 10,000 interviews expressing a wide variety of concerns about radiation and other matters. About 36 percent of the calls to the Human Experimentation Hotline were from veterans. Since the Hotline expanded to an Interagency Radiation Research Helpline on January 26, almost 2,400 additional contacts have been completed, and about 18 percent of these interviews were with veterans. The callers have expressed concerns about a range of nonradiation exposures including agent orange, mustard gas, and nerve gas. Many of these exposures were not mentioned in the context of radiation experiments or research, but as exposures received during military duty.

Mr. **BRYANT**. All right. The advisory committee, once it has issued its 6-month interim report, how much time do you think it will take the working group to make recommendations to the President and to the Congress?

Mr. **NORDHAUS**. I would like Frank to answer that.

Mr. **HUNGER**. I have made that same inquiry, Congressman, and I know that every effort will be made to have a final report 1 year after the time that the executive order was entered. I am in hopes that during the interim of the 6-month period and the 1-year period, that we will have information that we can bring to your attention that might form the basis of our being able to go forward with recommendations for appropriate relief for the victims of these experiments. But I can make no guarantees in that regard.

Mr. **BRYANT**. I assume you contemplate recommendations on the issue of compensation, right?

Mr. **HUNGER**. Certainly on relief of some type, and part of that relief most assuredly can be compensation for some of these victims. Right now, sir, I just must emphasize that we have so little facts on what all is involved here and we need the facts, we need the information in order to make a recommendation that I think you would be comfortable with.

Mr. **BRYANT**. Could you explain to the subcommittee the legal reasons why military and civilian test subjects, such as those we have heard from today, even if they can prove harm from the testing may be unable to gain compensation by suing the Federal Government.

Mr. **HUNGER**. Well, if the suit is brought under the Federal Tort Claims Act, the Department of Justice is obligated under the law to assert certain defenses that are available, one of which is known as the Feres Doctrine. The Feres Doctrine is derived from a case that was decided by the U.S. Supreme Court some many years back which provided that a serviceman who sustains injury as a result of his service or related to his service cannot recover in a tort action against the United States. And that is one of the reasons. There may be others, but there are many factors that go into a Federal tort claims action and defenses which can be asserted. But generally when you speak of a military situation, the first thing that pops into the mind of the attorney who may be called upon to defend that suit is the Feres Doctrine.

Mr. BRYANT. And civilians?

Mr. HUNGER. Civilians, Congressman, causation is always an issue that is involved in a Federal Tort Claims Act case. In other words, what caused the problem, who caused it? Did the United States, through a negligent action of one of its employees, actually do that? The statute of limitations. The law provides that a claim must be brought within 2 years after it accrues.

And then of course you go to the next question. When does a claim accrue? There are numerous cases that define that that would have to be carefully looked at to see whether a statute of limitations would apply. A Federal Tort Claims Act suit for the purposes of substantive law looks to the State where the act or occurrence took place so that particular State's law is involved. There are just many defenses that are available under the Federal Tort Claims Act, and I have just named a few for you.

Mr. BRYANT. Defenses meaning ways in which the Government can assert that it has no obligation to pay the claim?

Mr. HUNGER. Not necessarily that it has no obligation to pay the claim, sir, but that this is the law. We have the duty to assert that law and that is what is done. It would be a valid defense to the suit.

Mr. BRYANT. Very well.

Mr. Gekas.

Mr. GEKAS. Yes. I thank the Chair.

Mr. Henderson, you and the others alluded to the retrieval process that is under way so that we can get the data together for the eventual work of the administration and the Congress. But it seems to me that we already have, from the testimony that you have given, areas in which documents have already been present and should be a part of the record and easily retrievable.

The Eisenhower administration, 1953, began that process with the individual claim entity that was put together, according to your testimony. In 1974, in the Nixon-Ford administration—I always get that mixed up as to 1974, who was in or out at that particular time—but the Nixon-Ford administration in 1974 to which you alluded, and then in 1991 in the Bush administration with the final act of consolidating these efforts.

Each one of these eras, it seems to me, 1953 to 1974 and 1974 to 1991, had to produce a volume of documents which you could get tomorrow it seemed to me. Am I wrong on that?

Dr. HENDERSON. You are right in part in that there have been reviews done and they have focused in particular areas. The question is how exhaustive they might have been. We would like to be sure that we cover everything dealing with human exposure experiments to ionizing radiation. We know for example, that within our own agency we have not done in the past a comprehensive review of all grants made by the National Institutes of Health.

You are quite correct that there are collections of documents which cover this subject in part, but there are areas which we do not feel were fully covered in search. It is the commitment of the administration to do a thorough job on this to be sure we have identified all relevant expriments.

Mr. GEKAS. Which brings me to the question that naturally follows, and that is, of those documents which will not be easily retrievable because of the—we say easily retrievable, I say it because there is a bank of them already—do we have any problems with it? Do you anticipate any problems with classified documents? And to what extent have we broken down classified documents already to make the revelations that have already been made? Is there any cogent answer to that?

Mr. NORDHAUS. For the most part, the underlying documents are not classified. Those that are, the Department of Energy, anyway, is going to declassify as promptly as possible. I don't regard that as a very serious impediment.

I think the greatest difficulty is finding the records, and certainly in our case the records are scattered around and in the hands of numerous contractors, hospitals and the individual investigators. Gathering these records from around the country, and simply locating them requires more than a simple search of Federal records. We have asked each of our present and former contractors to locate the records and to give us access to them, copies of them, and that is in process now. But actually assuring ourselves we have the records, reviewing them and then following up on them to determine whether the subjects of the experiments are still alive and whether they suffered any harm from the experiments——

Mr. GEKAS. I understand that. What I am getting at is you ran rather facilely over the classification question I asked because you just assumed the Department of Energy and Secretary of Energy can simply declassify them; is that correct? Can the Secretary of Energy simply declassify what has previously historically been classified?

Mr. NORDHAUS. For the most part, yes.

Mr. GEKAS. The President doesn't have to sign off or the Congress have any say in that?

Mr. NORDHAUS. For most of our records I believe the declassification authority rests with the Secretary.

Mr. GEKAS. How about in the Department of Justice?

Mr. HUNGER. I know that there will be an effort made here to promptly declassify any record that is classified as promptly as can be done.

Mr. GEKAS. How will the Department of Justice do that?

Mr. HUNGER. I assume there are procedures set up in the Department to take care of situations just as that. There are other instances dealing with situations other than what we have before us today when the Department declassified some.

Mr. GEKAS. I think I will expedite by asking you each if you don't mind to accommodate us with a memorandum as to how declassification would occur within each segment if required. I have got to know that, and I want to see how that interplays with the Defense Department and its classification, and the intelligence community, et cetera. That is important to the Nation as well as to this inquiry so I don't want—in the rush—not rush, but necessity of delving into these problems to hurt our national security or in any other way hurt the classification system to which we look for our national security purposes.

Dr. HENDERSON. This is a subject we have discussed in the task force and there is every effort being made to declassify to the extent possible.

Mr. GEKAS. I understand that. I just want to clarify some joint procedure by which we can proceed.

I yield back the balance of my non-time.

Mr. BRYANT. Mr. Mann.

Mr. MANN. Mr. Chairman, thank you.

I want to make sure, first of all, that the interagency task force is including all the radiation experiments that we have heard about including the University of Cincinnati Medical Center program in the late 1960's, early 1970's. I assume it is on the list. If it isn't, you will make sure for me.

Mr. NORDHAUS. It is within the scope of the inquiry.

Mr. MANN. OK.

Mr. NORDHAUS. And one of the problems that we have had as we have gone through it is that—a number of these experiments are coming to our attention—there is no master list of the experiments and we find out about them either through the press or in the course of review of agency records. But the University of Cincinnati experiment is within the scope of the inquiry.

Mr. MANN. We have done a lot of talking about radiation, or the previous panel talked about some examples that involved things other than radiation. Yet, there was a lack of informed consent apparently on the same set of issues. How do we get at that? Is your task force going to concern itself with those kinds of instances, experiences?

Mr. NORDHAUS. The present charter of the task force is the human radiation experiments, that is the experiments involving subjecting humans to ionizing radiation. The LSD experiments and I believe the mustard gas and similar experiments have been subject to previous inquiry, but the charter of the advisory and the interagency group is limited to the human radiation experiments and some related experiments relating to intentional releases of radiation.

Mr. MANN. To the extent that other experiments have not been adequately addressed, I assume you would agree that in principle there is no reason to treat them differently than the issue of radiation. You have the same questions of informed consent, whether compensation is appropriate and all the rest.

Mr. NORDHAUS. I would like to defer to the Veterans' Administration and Department of Defense on this, but a number of these experiments are covered by existing compensation schemes for service-related disability, for instance, so that they may present somewhat different issues than the human radiation experiments, which for the most part were not conducted on members of the armed services. Some were, but for the most part they were conducted on individuals who were not within the ambit of existing statutory compensation schemes.

Mr. MANN. OK. No further questions.

Mr. BRYANT. Mr. Goodlatte.

Mr. GOODLATTE. Thank you, Mr. Chairman.

Mr. Hunger, to follow up on that a little bit, how far back do you anticipate—or any of you—how far back do you anticipate you will be looking at these experiments? Do you think there should be any cutoff?

Mr. NORDHAUS. The interagency working group and the advisory committee are going back to the earliest known human radiation experiments, which are in the mid-1940's. So the cutoff date is 1944.

Now, I would assume that if earlier experiments came to light that they would also look at those, but the earliest ones we know about are those that were conducted in connection with the Manhattan project in 1944 and 1945.

Mr. GOODLATTE. Can you tell us whether the Government is today engaging in any human experimentation with regard to radiation?

Mr. NORDHAUS. Speaking for the Department of Energy, yes, there is ongoing experimentation that is described in my testimony. We believe that all of the experiments that the Department of Energy is sponsoring are in full compliance with the governmentwide guidelines for human experiments. And the Secretary will verify that within the next few weeks, I believe.

Mr. GOODLATTE. Have any of the agencies of Government in the past had similar guidelines that may have been thought suitable at a different time that were applied when these experiments were conducted 50 years ago?

Mr. NORDHAUS. Well, the earliest, I am probably not the person to speak to this, but since 1947, the Nuremberg Code has been regarded as a binding norm and that incorporates most of the substantive content of informed consent. But Dr. Henderson may want to respond more specifically to that.

Dr. HENDERSON. The treatment of human subjects and the conduct of experiments has evolved from the time the principles were enunciated in the Nuremberg Code. Increasingly, trials have been more closely and appropriately vetted to assure that they are properly designed and balance both benefit and risk; informed consent provisions have been more and more formalized so that one could be more assured that there was competent consent. In brief, procedures have gradually evolved, become more elaborate over time and more widely applied.

Mr. GOODLATTE. Leaving aside the issue of informed consent, which I think is obviously of great concern here, it seems to me we probably agree that some of the experiments that were conducted back then are things that we would not consider appropriate at this time because of the evolution of knowledge about radiation.

And I guess what I am asking is, are you going to be looking at what standard you are going to apply in terms of whether the Government should be giving compensation to somebody based upon what we know about this now or based upon what was a reasonable, assuming a person was fully informed about what they were exposed to, a reasonable standard that they were applying based upon the knowledge at the time?

Dr. HENDERSON. The expert advisory committee which has been selected embraces the broad range of expertise necessary to address this question. The expertise ranges from historians to ethicists to radiobiologists and so forth, so that indeed they will have perspective on the whole.

Mr. GOODLATTE. Well, this is going to be an ongoing concern because obviously 50 years hence the conclusion may be reached that the experimentation that is going on right now and that you seem to be of the opinion is meeting standards—and obviously we know of benefits of radiation in medical field and so on—but 50 years hence we may find again that the standards we apply today are not living up to what is expected at that point in time.

How do you address this issue of whether we are compensating somebody based on what was reasonable at the time or what is reasonable time 50 years later?

Dr. HENDERSON. I think your point is well taken. I think we take into account not only the informed consent but also the benefits to the individual and the risks to the individual as they were known at that particular point in time.

You are quite right that understanding changes over time, as we test, for example, different drugs we may feel at a point in time, that they are perfectly safe but when applied to larger groups, rare but serious complications occur which curtail or even preclude further use of the drugs. So things do change. This will certainly be taken into account by the advisory group and by the task force.

You are quite right; we need to look at what was known at the time and what was good practice at the time.

Mr. GOODLATTE. Thank you, Mr. Chairman.

Mr. BRYANT. This committee has the obligation to process claims against the Government and we receive numerous applications to attempt, in our forum, to adjudicate these claims and we are quite apprehensive about what we might be facing in the near future.

I would ask each of you to please let us know when the profile of this burden comes into view for you. And I am quite sure the Budget Committee of this House would like to know the same thing as soon as you see where we are going.

Thank you very much for being here today.

Mr. BRYANT. We would like the third panel to come forward consisting of Dr. Harold Smith, Assistant to the Secretary for Atomic Energy at the Department of Defense; Mr. David Gries, Director, Center for the Study of Intelligence, Central Intelligence Agency; and Ms. Mary Lou Keener, General Counsel, Department of Veterans Affairs.

Inasmuch as the formal statements of each of the witnesses today will be made a part of the record, we would strongly urge each of the witnesses to confine your remarks to initially 5 minutes and attempt to summarize within that period of time and then permit us to pursue lines of questioning.

We will begin today with Dr. Smith.

STATEMENT OF HAROLD SMITH, ASSISTANT TO THE SECRETARY FOR ATOMIC ENERGY, DEPARTMENT OF DEFENSE

Mr. SMITH. Mr. Chairman, members of the committee, it is an honor for me to appear before you today on behalf of the Department of Defense. I am accompanied by Ms. Joan Pierre, Director for Radiation Sciences at the Defense Nuclear Agency, who will be able to respond to your questions about the details of the nuclear test personnel review, the so-called NTPR.

In addition, Ms. Jean Fites, Deputy Assistant Secretary of Defense is with us. She is thoroughly familiar with the process by which we are searching our records.

You have heard the description of the interagency working group now in place to conduct the search and retrieval of records of human radiation experiments. It is not necessary to describe that process again. The Department of Defense is a full and active participant in the process, and the Secretary of Defense himself has placed a high priority on that project. As the interagency working group was established, he appointed personnel from the highest levels of the department to serve on the working group. Simultaneously, he charged those persons with the additional duty of serving on a steering committee panel formed to oversee the Department's search and retrieval endeavor.

The steering committee is acting as a board of directors for a command center which is up and running. That center is headed by Rear Admiral Weisly and will be the collection point and clearinghouse for all the records discovered in this project.

As one might imagine, this retrieval process requires an extensive search based upon the experience of DOD's NTPR Program. The command center is to be the central point to which records can be referred, catalogued, and reviewed.

I would also like to add, Mr. Chairman, that DOD continues to administer the nuclear test personnel review. This program was initiated in the late 1970's to identify and assist veterans and selected DOD civilians who participated in the U.S. atmospheric nuclear testing.

In 1988, the NTPR was expanded to cover DOD personnel who participated in the post-war occupation of Hiroshima and Nagasaki. The program provides individuals with participation data and exposure levels to assist them in applying for health care or compensation from the Department of Veterans Affairs and Department of Labor, which are responsible for determining an individual as eligible for health care or for compensation.

A few facts. As of January 1, 1994, 2,000 individuals have been identified as participating in the U.S. atmospheric nuclear test program. Another 2,000 were associated with the occupation of postwar Japan. Over the past 5 years, about 2,000 new program participants have been added to the program annually.

Reaching out to these individuals has been a challenge. DOD has relied on an outreach program to encourage them to contact us. A key component of that outreach has been the toll-free hot line. Contact has been established with approximately 70,000 individuals. The Department of Defense and its Defense Nuclear Agency remains fully committed to its philosophy of honesty, candor, and thoroughness in the management of this program.

I would like to make just a few additional statements, Mr. Chairman, on that I can report today on work more than process, I can report on some progress.

For example, the Air Force initiated its search through nine sources concentrating on medical and research labs. The Army's search is concentrated on five sources, among them 700 linear feet of boxed records at Dugway Proving Grounds. I cannot say how many of these involve radiation experiments. I can simply say that that is the size of the records which will be investigated at Dugway.

The Navy has contacted 30 of its medical and research organizations and reviewed over 4,000 contract records, concentrating on the office of naval research. A multiservice search of about 3,000 titles from the Defense Technical Information Center has identified 514 which may contain information on radiation testing. This has been done in a few short weeks.

So far, the Air Force has identified six definite radiation exposure studies. The Army has identified approximately 120 radiation experiments. The Navy has identified 15 contracts with universities that they need to review to determine if they contain information on human radiation testing.

There is no doubt that there is much to be done, and as we investigate these records, we must of course protect the privacy of individuals. But nonetheless, the command center is up and operating. The results are beginning to come in. I am very proud of the effort that the Department has made to date.

Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Smith follows:]

Statement
of
Dr. Harold Smith
to the
Subcommittee on Administrative Law and Government Relations
Committee on the Judiciary

February 2, 1994

Mr. Chairman and Members of the Committee, it is an honor for me to appear before you today on behalf of the Department of Defense. I am accompanied by Ms.Joan Pierre, Director for Radiation Sciences at the Defense Nuclear Agency, who will be able to respond to your questions about the details of the Nuclear Test Personnel Review (NTPR). In addition, Ms. Jeanne Fites, Deputy Assistant Secretary of Defense (Requirements and Resources) within the Office of the Assistant Secretary of Defense for Personnel and Readiness, is here as well.

You have heard the description of the Interagency Working Group now in place to conduct the search and retrieval of records of human radiation experiments. It is not necessary to describe that process again. The Department of Defense is a full and active participant in this process, and the Secretary of Defense has placed a high priority on this project. As the Interagency Working Group was established, he appointed personnel from the highest levels of the Department to serve on the working group. Simultaneously, he charged those persons with the additional duty of serving on a steering committee panel formed to oversee the Department's search and retrieval endeavor.

The steering committee is acting as a "board of directors" for a Command Center which we have established. That center is headed by a Rear Admiral and is to be the collection point and clearinghouse for records discovered in this project. As one might imagine, this retrieval process requires an extensive search. Based upon the experience of DoD's NTPR program, the command center is to be the central point to which records can be referred, cataloged, and reviewed.

While we cannot simply go into the attics or cellars of the Department and pull out boxes labelled "Human Radiation Experiments", the Department will not be deterred by the complexity or difficulty of the task confronting us. We are fully committed to this effort. We are acting as quickly as possible to find and catalog records. We will collect those records and review them. We will release them as comprehensively and as soon as possible, recognizing that we must proceed in a way that protects the privacy of citizens who may have been participants, knowingly or unknowingly, in those experiments.

It is important to understand that this is a discovery process requiring some time before a full report can be provided to Congress and the people of this country. We have all read or heard media reports of radiation experiments in which human subjects participated. They will all be a part of our search. In the interim, we want to make it clear and emphasize to you that we are fully commitied to this effort. We are acting expeditiously to find and catalog records. We will collect those records and review them. We will release them as comprehensively and as soon as possible, recognizing that we must proceed in a way that protects the privacy of citizens who may have been participants, wittingly or unwittingly, in those experiments.

NUCLEAR TEST PERSONNEL REVIEW

In the meantime, DoD continues to administer the Nuclear Test Personnel Review. This program was initiated in the late 1970s to identify and assist veterans and selected DoD civilians who participated in the U.S. atmospheric nuclear testing. In 1988, NTPR was expanded to cover DoD personnel who participated in the post-war occupation of Hiroshima and Nagasaki, Japan. The program provides individuals with participation data and exposure levels to assist them in applying for health care or compensation from the Departments of Veterans Affairs and Labor, which are responsible for determining an individual is eligible for health care or compensation.

As of January 1, 1994, 205,472 individuals were identified as having participated in the U.S. atmospheric nuclear testing program. Another 195,753 DoD personnel were associated with the occupation of post-war Hiroshima and Nagasaki. Over the past five years, about 2,000 new program participants have been added to the program annually.

Reaching out to these individuals has been a challenge. DoD has relied on an outreach program to encourage them to contact us. A key component of that outreach has been a toll free hot line. Contact has been established with approximately 70,000 individuals.

The Department of Defense, and the Defense Nuclear Agency remains fully committed to its philosophy of honesty, candor, and thoroughness in the management of this program.

The Department of Defense's full participation in the Human Radiation Interagency Working Group and its administration of the Nuclear Test Personnel Review represent an intense collective attempt to accumulate information necessary to identify those individuals who participated in radiation experiments. Candor and openness have marked each of these endeavors and will continue to serve as hallmarks by which this administration conducts these efforts.

Those brave military personnel, their families, and the American people deserve no less than a full accounting of experiments in which human subjects were used.

Mr. **BRYANT**. Thank you, Mr. Gries.

STATEMENT OF DAVID GRIES, DIRECTOR, CENTER FOR THE STUDY OF INTELLIGENCE, CENTRAL INTELLIGENCE AGENCY

Mr. **GRIES**. Thank you, Mr. Chairman.

The CIA has launched an extensive investigation of its records, and that investigation is ongoing. I am pleased to say that so far no evidence of radiation testing on human subjects has been found. However, the search continues.

Let me explain in a little detail what the search consists of. In the mid-1970's because of allegations of wrongdoing, three congressional committees looked into the activities of the CIA in a very thorough way. In addition, there was one Presidential Commission, the Rockefeller Commission. The files from all these investigations, four of them to be exact, were segregated and kept in one place, and since we reasoned that if there had been any radiation testing it would have been uncovered in those activities, those investigations, we went immediately to those files. It was a relatively simple job for us because they were in one place.

However, some of the files that related to the activities investigated by those committees and the Rockefeller Commission had been destroyed in 1973 and then partially reconstructed 4 years later when the financial files of the concerned projects, those that had been investigated, were located. So we went then to that batch of files which was segregated after the committees of Congress had completed their work.

There were a few gaps in those files and we have attempted to fill them by telephoning or meeting with now over 40 CIA employees—many are now, of course, retired—who were involved in the project in one way or another, ranging from three Directors of CIA down to the scientists and researchers who were actually involved in the projects. And again, we have turned up no evidence whatsoever of radiation testing nor any recollection by any of the people involved that such might have occurred.

We are vigorous in our effort because both the Rockefeller and Church Committee reports mention radiation testing in a sentence duplicated in both reports, which in turn is drawn from a 1963 CIA internal investigation which explains the charter of a program that the Agency undertook between 1953 and 1963 which permitted chemical testing, other kinds of testing of ways to alter human behavior, and it included a charter for radiation testing. But our determination thus far is that no radiation testing ever occurred.

The search continues. We have a steering group inside the agency. There are dozens of people working on this. Computers are being loaded with key words and a very broad search is underway, and we intend to continue this until we are absolutely positive that no radiation testing occurred. And so far, no evidence of it has shown up.

Thank you.

[The prepared statement of Mr. Gries follows:]

STATEMENT OF DAVID GRIES

Before the Subcommittee on Administrative Law
and Governmental Relations

Committee on the Judiciary
U.S. House of Representatives
Wednesday, February 2, 1994

Good afternoon, Mr. Chairman. My name is David Gries, and I am the Director of the Center for the Study of Intelligence, Central Intelligence Agency. The Director of Central Intelligence has appointed me as the CIA's representative to the interagency working group on radiation testing. I am pleased to testify today on the CIA's efforts to determine whether the Agency ever took part in any radiation testing on human beings. Although our searches continue, we have not found any information thus far indicating that the Agency ever conducted or participated in such testing.

I would like to describe the extensive efforts we are making to search our records. On Tuesday, 4 January 1994, CIA started an Agency-wide search for records bearing on any possible CIA involvement in testing the effects of radiation on humans. A steering group was established to coordinate the effort. We focused our efforts initially on records pertaining to the MKULTRA program, which I will briefly describe.

The MKULTRA program was established to counter perceived Soviet and Chinese advances in brainwashing techniques. Between 1953 and 1964, the program consisted of some 149 subprojects which the Agency contracted out to various universities, research foundations and similar institutions. Some of the subprojects involved drug testing on unwitting human subjects, but most involved other areas of behavior. In 1963, the Agency's Inspector General inspected the program and issued a report on MKULTRA. The Agency destroyed most of its MKULTRA records in 1973.

In 1974 and 1975, the Rockefeller Commission and Church Committee conducted extensive investigations of CIA human research activities, relying on extant documents, interviews and testimony. Both of these bodies issued public reports that discussed the MKULTRA program in some detail and noted that "radiation" was one area within the MKULTRA program charter. In 1977, CIA's discovery of program financial papers enabled CIA to reconstruct files on virtually all MKULTRA subprojects and led to another Congressional investigation and testimony before the Senate Select Committee on Intelligence and Senate Committee on Human Resources. Once again, these Committees issued public reports discussing the MKULTRA program in detail. Most Agency records on the MKULTRA program were declassified and made public long ago.

These extensive and public investigations made it possible for our current researchers to assess virtually every one of the 149 subprojects and to follow up those that looked of interest. The task was made easier by the fact that the MKULTRA program files are centrally located. In addition, CIA researchers are reviewing the extant records from other programs (largely drug related) that may have conducted intrusive research on humans. We are also reviewing and checking the voluminous documentation on intrusive research compiled in response to the Rockefeller Commission, Church Committee and SSCI/SCHR investigations, as well as the approximately 11,000 pages of documents released in response to Freedom of Information Act requests.

We also studied the 1963 Inspector General's report on MKULTRA and a 1973 compendium of employee reports of improper or illegal activities. We interviewed more than 40 current and former employees, ranging from former DCI's to the scientists and medical personnel most likely to have conducted or been aware of radiation testing, had it occurred. Simultaneously, Agency records managers and offices are carrying out wide ranging searches for any indication whatsoever of radiation testing. I should emphasize that we have based our search inquiries on the broadest and most comprehensive usage of the term "radiation".

To date, CIA has found no evidence of any ionizing radiation testing on humans ever carried out under its auspices. Further, none of the employees or senior officers whom we consulted, and who were in a position to know, have ever heard of the Agency conducting such an activity.

We believe the statement appearing in the Rockefeller Commission and Church Committee Reports originated as standard phraseology in early documents mentioning radiation as a potential area of MKULTRA research. However, we have not located any documents thus far showing that radiation testing on humans was pursued.

Despite these findings, a vigorous research effort going beyond the MKULTRA program is continuing. Computer searches of data bases are underway throughout the Agency, and an effort is being made to locate any records that may have been missed when MKULTRA files were reconstituted in 1977.

That was the past, what about now? Since they took effect, the Agency has strictly followed HHS regulations pertaining to the conduct of human subject research. We have established an internal review board and rigorous procedures to ensure that any proposal for such research complies in every respect with these guidelines. In recent years, very few proposals have been considered and certainly none have involved radiation or drug testing on human beings.

In conclusion, thus far, CIA has found no evidence of any kind that the Agency has ever deliberately exposed any person to ionizing radiation, whether for research into human behavioral modification or for any other purpose. Our research continues, however, and will not conclude until we are certain that all pertinent records have been reviewed. We are committed to locate, review and declassify any evidence of ionizing radiation experiments on humans.

Thank you, Mr. Chairman.

Mr. BRYANT. Thank you.

Ms. Keener.

STATEMENT OF MARY LOU KEENER, GENERAL COUNSEL, DEPARTMENT OF VETERANS AFFAIRS, ACCOMPANIED BY SUSAN MATHER, ASSISTANT CHIEF MEDICAL DIRECTOR FOR ENVIRONMENTAL MEDICINE AND PUBLIC HEALTH, AND PATRICK COURTNEY, DEPUTY DIRECTOR FOR THE COMPENSATION AND PENSION PROGRAM

Ms. KEENER. Thank you very much, Mr. Chairman.

Joining me today from the VA are Dr. Susan Mather, who is the Assistant Chief Medical Director for Environmental Medicine and Public Health, and Mr. Patrick Courtney, who is Deputy Director of the Compensation and Pension Service.

Since my prepared remarks will be made a part of the record, I would just like to briefly summarize the main points that I wish to cover today.

VA has two principal interests in the important issues being considered here. First, with the other departments and agencies represented, we are participating in the ongoing work of the Human Radiation Interagency Working Group.

We are determined to ascertain to the fullest extent possible whether VA has ever conducted or sponsored radiation-related experimentation on humans that was of dubious merit or means. Secretary Brown has appointed me to oversee the VA's role in this high priority effort.

Our ongoing records search is a very ambitious undertaking given that, first of all, VA was a pioneer in nuclear medicine and conducted a great deal of radioisotope research.

Second, much of that research took place decades ago.

And finally, there is no single centralized repository for historical VA research records on this or other subjects. Nevertheless, as I said before, we are committed to a thorough search for the truth and a candid and open analysis of our findings.

Our second interest stems from the fact that VA is a department whose primary mission it is to administer benefits and services to military veterans, their dependents and their survivors. For example, we administer multibillion-dollar compensation programs for service disabled veterans and their survivors.

Ms. KEENER. If a veteran suffers a disability or a death as a result of disease or injury incurred or aggravated during service, the VA is authorized to pay that compensation.

In addition, service-disabled veterans qualify for VA health care benefits on a priority basis, and depending upon the nature of their disabilities may also be entitled to ancillary benefits, such as vocational rehabilitation and assistance in purchasing specially adapted housing or automobiles.

It may be of particular interest to this subcommittee that benefits are payable for injuries attributable to service members' participation in military research programs.

For example, veterans who as service members were exposed to ionizing radiation while participating in atmospheric nuclear weapons test, to mustard gas or other agents during tests of protective clothing and equipment, or who were administered LSD in Army chemical warfare trials may be compensated for any resulting disabilities and their survivors for any resultant death.

Also, under title 38 of the United States Code, if it were determined that veterans were injured as a result of human experimentation due to fault, including the failure to obtain informed consent on the part of any VA care provider, the VA would be authorized to compensate veterans for disabilities or their surviving spouses or children for resulting deaths, and VA health care could be provided the veterans for their disabilities.

In order to address the many unique problems the eligibility determinations may pose, Congress and VA have developed extensive specialized rules which facilitate the awarding of benefits on a presumptive basis where that is warranted. For example, Congress has created statutory presumptions of service connection for certain cancers suffered by atomic weapons test participants, and VA has recently proposed similar rules regarding diseases which may be associated with mustard gas exposure. To the extent that VA programs authorize benefits and services based upon all service-connected disabilities or deaths, the concerns over relief for persons injured in service-related experimentation are already being addressed.

Again, Mr. Chairman, I thank you for inviting the VA to participate in this hearing today, and we would be happy to answer any questions that you may have. However, we would ask that with all due respect for privacy issues involving the status of individual claims that if you do have questions regarding those individual claims that we be able to respond to them in writing.

Thank you very much.

[The prepared statement of Ms. Keener follows:]

STATEMENT OF
MARY LOU KEENER
GENERAL COUNSEL, DEPARTMENT
OF VETERANS AFFAIRS
BEFORE THE
SUBCOMMITTEE ON ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS
HOUSE COMMITTEE ON THE JUDICIARY
FEBRUARY 2, 1994

Mr. Chairman and members of the Subcommittee, I am pleased to be here today to discuss our efforts to determine if VA has ever conducted or sponsored inappropriate radiation-related experiments on humans, and to assist you in determining the appropriate government response to concerns about those issues.

Secretary of Veterans Affairs Jesse Brown is a member of the cabinet-level Human Radiation Interagency Working Group. The Working Group is coordinating Executive-branch efforts to determine whether experimental abuses have occurred, and if so the appropriate governmental response. Secretary Brown has committed the Department to a thorough, accurate and energetic review of its nuclear medicine activities and records. He has appointed me to chair VA's internal coordinating committee for this effort. We are determined to learn whether any radiation-related experimentation of dubious merit or means was ever performed under our aegis, and to share our findings fully with the Congress and the American people.

Our search for the truth is an ambitious undertaking. During the early years of the Nuclear Age, VA was a pioneer in nuclear medicine and conducted a great deal of research using radioisotopes which produced major advancements in patient care. When a review of centrally held research and nuclear medicine records revealed no information on specific research projects, protocols or human subjects, the Secretary required each of our 172 VA medical centers to search its files to determine if it exists locally. All VA facilities are currently engaged in this effort, which includes a search for any documentation of experiments VA conducted in conjunction with its affiliated medical schools or which it contracted out. We hope to have initial reports from all facilities regarding their searches by February 4.

We are currently preparing a protocol for the formal retrieval and inventory of these records. These procedures, being developed in coordination with the Interagency Working Group, will facilitate the orderly provision of documentation to the President's Advisory Committee on Human Radiation Experiments. Of course, due care will be taken to protect the privacy of research subjects throughout the review.

The President's Advisory Committee is being charged with determining whether:

(1) there was a clear medical or scientific purpose for the experiments;

(2) appropriate medical follow-up was conducted; and

(3) the experiments' design and administration adequately met the standards of informed consent that prevailed at the time of the experiments and meet the standards that exis today.

Mr. Chairman, we share in the insistence that, should inappropriate experimentation be identified, there be a prompt and adequate governmental response. Such a response will be developed in a timely fashion. Certainly, at a minimum the Government should provide appropriate information to experimental subjects and their families and, where required to protect their health, notify them of any potential health risk or need for medical follow-up. Whether anything more is warranted must neces-sarily await the findings of what transpired and the likeli-hood of any resulting injury.

VA is perhaps unique among the concerned Federal agencies in already having statutory authority to compensate for injuries to veterans resulting from radiation exposure that occurred either during their military service or in connection with negligent clinical treatment at VA health-care facilities following service. Under title 38 of the U.S. Code, if it were determined that veterans were injured as a result of human experimentation while in service, or due to fault (including failure to obtain informed consent) on the part of VA-care providers, VA would be authorized to compensate veterans for disabilities or their surviving spouses or children for resulting deaths, and VA health care could be provided the veterans for their disabilities.

I hope I have conveyed the strength of the Secretary's commitment to addressing the very real concerns of our nation's veterans that their Government may have misled some of them or otherwise abused its trust in the interests of radiation-related research. We want veterans to continue to use our toll-free number (1-800-827-1000) to share their concerns with us. We intend to do all we can to learn whether abuses have occurred, and to do the right thing if indeed they have.

I would be pleased to respond to any questions you or others members may have.

Mr. BRYANT. Ms. Keener, let me ask you about LSD testing. How many cases has your agency compensated for LSD testing?

Ms. KEENER. I am sorry, radiation?

Mr. BRYANT. LSD.

Ms. KEENER. In the area of LSD cases, we have not really been able to track the number of veterans who may be eligible for any kind of disability compensation in that area. We are aware of some possible claims and we are aware of one veteran who has been compensated for a claim regarding disability due to LSD. But we do not have such a good tracking mechanism right now that we could give you a specific number, and that is really all of the information that we have at this particular time.

Mr. BRYANT. Have you asked the Department of Defense to cooperate in ferreting out those people like the gentleman we had here earlier today that was the subject of LSD testing?

Ms. KEENER. Yes, sir, we have. In fact, Secretary Brown is sending a letter to Secretary Perry asking the Department of Defense to forward to us all information that they have regarding any military experiments that may have involved veterans so that we will be able to track those records and develop some outreach programs.

Mr. BRYANT. All of your testimony seemed to focus mostly on radiation. I would like to ask each of you if you believe that there is any legal or ethical reason why participants in experiments involving radiation should be treated differently than participants in other experiments involving humans that did not give informed consent. In other words, LSD, mustard gas, or anything else.

Dr. Smith.

Mr. SMITH. Mr. Chairman, I know of no reason why they would be treated differently. I concentrated on radiation experiments simply because the letter of invitation asked for that preparation, and because Mr. Aspin assigned me that duty. I do not have the charter to explore any other experiments on human beings, but I still will stand by my opening sentence, namely, I see no reason for distinguishing when it comes to matters of compensation.

Mr. BRYANT. What efforts, if any, have been made to determine how many victims we might have or whether or not there are victims may be a question of interpretation of the facts, but persons that were subjects of other types of testing done by the Defense Department, such as LSD or mustard gas?

Mr. SMITH. Mr. Chairman, I was appalled by what I heard today and I am not chartered and not prepared to answer that question for the reason I just gave a moment ago. I would very much like to take it for the record and you will get an answer.

[The information follows:]

******* COMMITTEE INSERT ********

Mr. BRYANT. Mr. Gries, you also limited your testimony to radiation testing, but the CIA, at least it has been commented a time or two has engaged in with regard to other types of testing, particularly psychological testing and so forth. How many participants were there in the testing that went under the MKULTRA and other mind control experiments done by the CIA?

Mr. GRIES. The number is not known at the moment. It is something that we have to find out. But it probably is less than 200, something like that.

Mr. BRYANT. How many of them have been compensated?

Mr. GRIES. Probably less than 20 have been compensated. There were a number of cases in the 1970's and 1980's which resulted in compensation settlements, but I don't have the exact number. We could get it for you and send it to the committee, but I believe it is less than 20.

[After checking their records, the CIA confirmed that the number is less than 20.]

Mr. BRYANT. Now, were those compensation settlements due to the fact that those people had a legally enforceable right to pursue compensation, or were they compensated because of some sort of retrospective sense of responsibility, or why?

Mr. GRIES. As far as I know, they brought suits and the suits were settled with compensation.

Mr. BRYANT. Do you know how much compensation generally these people received?

Mr. GRIES. No. I know that one suit resulted in compensation of about $60,000 per person; excuse me, $70,000 per person.

Mr. BRYANT. What kind of health or research followup has been conducted on the subjects of the MKULTRA experimentation?

Mr. GRIES. Mr. Chairman, as far as I know, none. And as I stated at the outset, one of our problems is that we don't have a good list of the subjects, and since that has been true since the time of the experiments, it is impossible for me to answer whether there was followup.

Now, the reason this arises I think is the same in most Government departments. The experiments were carried out under contract to institutions which in turn hired researchers to conduct the experiments. So there was a considerable distance between the Government and the experiment. Presumably, the records of the subjects and any medical followup if it occurred would rest with the institutions. This is something that has to be looked into.

Mr. BRYANT. So most of these subjects were not employees of the CIA?

Mr. GRIES. No. In some of the LSD testing, some CIA employees were consenting participants. This was at the time when no one really knew the properties of LSD, but I think they were very few in number.

Mr. BRYANT. OK. Dr. Smith, you mentioned a number of different groups that appear to have been identified as having been part of these tests and the numbers are kind of large and intimidating. Can you give me an idea of how many servicemen we are talking about totally that might have participated in these types of experiments?

Mr. SMITH. I think I can, Mr. Chairman. All I could do would be to repeat myself, sir. That is the number of institutions, the number of contracts, the number of titles. I am not prepared at this time to state the number of subjects that may have been involved in human radiation experiments.

Mr. BRYANT. All right. Do you know if the categories of people that you mentioned include individuals that knew they participated, or are these large categories of people that may or may not have known that they participated?

Mr. SMITH. The search is all inclusive. That is, we are first going to find out who participated, and then of course we will proceed to find out who participated under informed consent and who did not.

Mr. BRYANT. All right. Ms. Keener, the NAS study on mustard gas recommended that the VA and the Defense Department widely advertise veterans are no longer bound to secrecy about their participation in mustard gas experiments. Has that been done?

Ms. KEENER. I am not sure, Mr. Chairman. I will defer to Dr. Mather on that. She may have more information.

Ms. MATHER. As I understand it, we have put this out in veterans service organization magazines and that sort of way. We are at the present time trying to determine—there is no roster of the people who participate in the experiments, but we are—we have the rosters from Bainbridge, and we have a last name of the person who was in the experiment at the Naval Research Laboratory, and we are trying to match those up, and when we have a list, we have every intention of informing each individual using records from the IRS of their participation and the possibility of compensation and medical care.

Mr. BRYANT. Would you identify yourself for the record?

Ms. MATHER. I am Dr. Susan Mather.

Mr. BRYANT. Thank you. What type of medical followup is being done for the veterans that you have discovered that are out there that were exposed to mustard gas or lewisite?

Ms. MATHER. Whatever is indicated by the disease they have. There is a wide variety. There are a variety of diseases that have been associated with mustard gas exposure, primarily diseases of the eye or the respiratory track and some malignancies.

Mr. BRYANT. Finally, how did you determine for compensation purposes which diseases related to mustard gas testing were service-related and which ones were not?

Ms. KEENER. I will ask Dr. Mather to answer that one, too.

Ms. MATHER. What we used were the recommendations of the National Academy of Science for which there was clear association with exposure to mustard gas, diseases for which there was clear association.

Mr. BRYANT. Well, the committee would like to add to our questions written inquiries that you may be able to answer in more detail as you access data and staff members that are more up to date on some of this stuff. We will be forwarding those to you shortly.

Again, as you heard me say before, we are going to have to deal with an enormous number of claims in this subcommittee. I would like to know, if possible, the size of the workload that we are facing. We are grateful for your being here.

Thank you very much.

At this time we would invite the next panel. We may have a brief break before you testify in order that I might cast a vote. At this time the committee will extend a recess just for a few minutes while I go and vote, and then we will resume the testimony with the fourth panel.

[A recess was taken.]

Mr. BRYANT. Well, we thank the fourth panel for being here. It is a panel of a little different nature, and we are grateful to you for coming today and offering your expertise in how we ought to view this matter.

First, we have Gregg Herken, Chairman of the Space History Department of the National Air and Space Museum; Dr. John Rundo, a biophysicist from the Argonne National Laboratories; Dr. David Rall, Chairman of the Committee To Survey Health Effects of Mustard Gas and Lewisite for the National Academy of Sciences, Institute of Medicine; and Dr. Stewart Finch, vice president for research and development of the Cooper Hospital/University Medical Center.

We appreciate you being here. We will first start with Dr. Herken.

STATEMENT OF DR. GREGG HERKEN, CHAIRMAN, DEPARTMENT OF SPACE HISTORY, NATIONAL AIR AND SPACE MUSEUM

Dr. HERKEN. The subcommittee has asked me to give some historical background on the human radiation experience, the knowledge that my researchers and I have of these experiments comes from the documents that we have uncovered in some 3 years of research on the work of two of the physicians involved in the experiments at the University of California, Drs. Joseph Hamilton and Robert Stone.

There were three reasons for conducting radiation experiments on human beings. The first of these was to discover new and better methods for the diagnosis and treatment of cancer and other diseases. Both Hamilton and Stone pioneered in this area in the 1930's.

The study with the Manhattan project in 1942, a second motivation became to discover how radiation affected the body so that standards of exposure and, if necessary, methods of treatment could be devised for those working on the atomic bomb.

First under contract for the Army's Manhattan project and later for the U.S. Atomic Energy Commission, Dr. Stone exposed terminal cancer patients to whole body x-rays and high energy neutron beams. In May 1945 and July 1947, Dr. Hamilton injected three human subjects with plutonium at the University of California Hospital in San Francisco.

A third and final motivation for the experiments beginning with the Second World War, but becoming more prominent during the cold war was to identify the most effective killing agents and countermeasures for radiological warfare. As early as 1943 Stone and Hamilton discussed with the Army the possibility of poisoning enemy food and water supplies with fission products. By 1946, Hamilton, in fact, was an avid promotor of radiological warfare, so-called RW, and subsequently he became a consultant to the Army on the RW test it conducted in Utah between 1949 and 1953.

The difficulty in assessing motivation in the case of the radiation experiments comes from the fact that all three interests, therapeutic use, medical research, and military application were intimately entwined. Data gained from any one experiment would be useful to all three areas.

A hint of motivation, however, may come from the secrecy under which the experiments were carried out. The experimental procedures conducted by Hamilton and Stone in the 1930's were done from all of the evidence, with the subject's full knowledge and consent. On the other hand, none of the three subjects injected by Hamilton between 1945 and 1947 was informed in advance that the substance to be used was plutonium, nor was any subject informed of the characteristics of plutonium.

In May 1945 when the first injection occurred, plutonium in its application in the atomic bomb remained a military secret. That was, however, no longer the case by the time of the second and third injections in April 1946 and July 1947 respectively. The evidence indicates that even before these dates, Hamilton and Stone were interested in keeping the human experiments secret, not out of a concern with security, but because of an awareness of the controversial nature of the experiments were they to become more widely known.

Related to the matter of secrecy in turn is the question of consent. In none of the three plutonium injections was signed consent for the procedures sought or obtained. There is, however, some evidence that the question of consent came up between the Atomic Energy Commission and the University of California with the AEC seeking signed consent prior to the third and final plutonium injection.

In April 1947, the Commission evidently yielded to the request of the University of California's doctors that written certification by two physicians be accepted in lieu of a signed release by the subject, and indeed, this was the arrangement with the third human injectee, Mr. Elmer Allen.

On this and on subsequent occasions, the university's doctors defended their human experiments to the AEC on the grounds that they were carried out in their capacities as independent physicians in the employ of the university and not as AEC contractors. It is also clear from the documents that both the director of AEC's Division of Biology and Medicine, which approved the human experiments at this time and its advisory committee, were by the summer of 1948 expressing growing concern with the human experiments.

In 1949, the Director of the Division of Biology and Medicine, Dr. Shields wrote to Stone, "record me as voting against human experimentation."

Earlier, the Chairman of the Division's advisory committee had observed, quote, that a policy of secrecy in science is neither personally courageous or politically wise, unquote. Yet as we now know, the human experiments continued. The available documentary record of these experiments is both fragmentary and scattered.

At least part of it may have been deliberately destroyed. While the openness initiative of Secretary of Energy O'Leary deserves high commendation, the files of the Division of Biology and Medicine and its advisory committee are still closed to researchers at the Department of Energy lacking a security clearance.

Without access to the documents contained in these files, many of the questions about the radiation experiments, however, are likely to remain unanswered and indeed unanswerable. Among them: How many experiments were conducted that have not yet come to light? How much control did the AEC itself exercise over the experiments? What was the role of military research in the experiments? And perhaps most importantly and most puzzling, why did the experiments continue in the face of opposition from the head of the AEC's own Division of Biology and Medicine and its advisory committee?

Accordingly, one of the priorities of the current investigation, I feel, should be the immediate opening of these Department of Energy files.

Thank you.

[The prepared statements of Dr. Herken and Mr. David follow:]

TESTIMONY OF DR. GREGG HERKEN
CHAIRMAN, DEPARTMENT OF SPACE HISTORY
NATIONAL AIR AND SPACE MUSEUM, SMITHSONIAN INSTITUTION
FEBRUARY 2, 1994

The Committee has asked me to give some historical background on the human radiation experiments. The knowledge my researcher and I have of these experiments comes from the documents uncovered in three years of research into the life of physicist Ernest Lawrence. Two of the physicians involved in the radiation experiments on human subjects, Robert Stone and Joseph Hamilton, worked for or with Lawrence at the University of California in the 1940s and 1950s. During the Second World War and after, Dr. Stone exposed terminal cancer patients to whole body x-rays and high-energy neutron beams. Between May 1945 and July 1947, Dr. Hamilton injected three human subjects with a soluble form of plutonium at the University of California hospital in San Francisco.

There were three reasons for human radiation experiments. One was to discover new and better methods for the diagnosis and treatment of cancer and other diseases. Both Stone and Hamilton were pioneers in this area, dating from the mid-1930s.

Starting in 1942, a second motivation was to discover how radiation affected the body so that standards for exposure and, if necessary, methods of treatment could be devised for those working on the atomic bomb project. As of 1943, Stone reported to the Army, treatment of the victims of radiation accidents "consisted of vacations, transfusions and hope." Working first under contract for the Army's Manhattan Project, and later for the U.S. Atomic Energy Commission, Stone was most interested in the effect of direct radiation, from x-rays or neutron beams; Hamilton's primary interest was with the effect of radioactive isotopes, injected or inhaled.

A third motivation for the experiments--beginning in the Second World War, but becoming more prominent with the Cold War--was to identify the most effective killing agents and countermeasures for radiological warfare [RW]. As early as 1943, Stone and Hamilton discussed with Army representatives the possibility of poisoning enemy food and water supplies with radioactive isotopes. In January 1945, Hamilton reminded the Army that "almost all of our past and present efforts with fission products would be directly applicable...to the military needs of radioactive warfare." By 1946, Hamilton was an avid promoter of radiological warfare [RW], and subsequently became a consultant to the Army on the RW tests it carried out in the Utah desert between 1949 and 1953.

Although there is as yet no evidence that any of the human experiments conducted by Hamilton or Stone was directly connected with their interest in radiological warfare, in reality all three motivations--therapeutic use, medical research, and military application--were so "intimately intertwined," in the words of one of Hamilton's co-workers, as to be virtually indistinguishable. Data gained from any one experiment would be useful in all three areas. Certainly Hamilton and Stone, as other researchers, welcomed the financial support of their research by the Army, and later the AEC, as furthering the concerns of science. In turn, the Army and AEC had an interest in the work of physicians like Hamilton and Stone that was multifaceted, and included the peaceful as well as the military application of atomic energy.

Beyond the question of motivation, another element of interest in the radiation experiments is the secrecy under which they were carried out. From the evidence thus far available, none of the three human subjects injected by Hamilton was informed in advance that the material to be used was plutonium; nor was any informed of the characteristics of plutonium. In May 1945, when the first subject was injected by Hamilton, plutonium and its application remained a military secret. That was no longer the case, however, by the time of the second and third injections, in April 1946 and July 1947 respectively. Documentary evidence indicates that as early as February 1945, Hamilton and Stone were attempting to keep the human experiments shrouded in secrecy not out of a concern with security, but because of an awareness of the unorthodox and controversial nature of the experiments, were they to become more widely known.[1]

Related to the question of secrecy, as well, is the matter of consent. In the first two plutonium injections by Hamilton, the subjects were evidently informed only that they "were to receive a radioactive substance having certain properties." (Ironically, such a disclosure might have been more misleading than informative, since prior to these experiments, the principal use of radiation on human beings was for diagnostic or therapeutic purposes.) In the third plutonium injection, reportedly the "experimental nature of the...injection of the radioactive tracer sample was explained to the patient, who agreed on the procedure." In none of the three plutonium injections was signed consent for the procedure sought or obtained.

There is incomplete documentary evidence that the question of consent came up between the AEC and the University of California, with the AEC seeking signed consent, prior to the third and final plutonium injection. In April 1947, the Commission yielded to a request from the University's doctors that a written release not be required of the subject. Instead, a written certification by at least two doctors as to the subject's mental competence and willingness to accept the treatment after it had been explained was substituted for a signed release.[2] This was, in fact, the arrangement for the third human subject, Elmer Allen.

Apparently at the April 1947 meeting, and certainly on subsequent occasions, Hamilton and Stone defended past human experiments and justified future ones on the grounds that they conducted such experiments in their capacity as independent physicians in the employ of the University, and not as AEC contractors.

The matter of consent, in turn, raises the question of the AEC's role in continuing to authorize radiation experiments with human subjects. In December 1946, one week before yielding its authority to the AEC, the Manhattan Project put a sudden stop to the human radiation experiments. The following April, as previously noted, the AEC gave conditional approval for resumption of the experiments. By July 1948, however, Dr. Shields Warren, the director of the AEC's Division of Biology and Medicine (DBM), which approved the experiments, had begun to express reservations about them. That fall, Dr. Alan Gregg, the chairman of the division's Advisory Committee on Biology and Medicine likewise informed Stone that he and his colleagues no longer had confidence in Stone's judgment, on account of the latter's human experiments.[3] In July 1949, Warren informed Stone that he was "taking an increasingly dim view" of the human experiments. "Consequently, record me as voting against human experimentation," Warren wrote.

The documentary record of human radiation experiments, even the relatively small portion dealing with only Stone and Hamilton, is both fragmentary and scattered. While the extraordinary "openness" initiative of Secretary of Energy Hazel O'Leary deserves high commendation, the records of perhaps greatest interest--the files of the Division of Biology and Medicine, and its Advisory Committee on Biology and Medicine--still remain closed to researchers lacking a security clearance.

Without access to the documents contained in these files, many of the questions which surround the radiation experiments are likely to remain unanswerable. Among them: How many other injection experiments using human subjects were there? How much control did the AEC itself exercise over the human experiments? What role did military-related research--and, specifically, the AEC's Division of Military Application--play in the experiments? And, perhaps most importantly, why did the experiments continue in the face of opposition from the heads of the Division of Biology and Medicine and its advisory committee?

Accordingly, one of the priorities of the current investigation into government-sponsored human experimentation should be the immediate opening of these Department of Energy files.

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1. Hamilton, for example, rejected Stone's choice of a collaborator at UC hospital on the grounds that the latter was "an individual of more than average ability and I think he would soon realize that something very peculiar was going on." Hamilton to Stone, 6 Feb. 1945. Document in possession of Patricia Durbin, Lawrence Berkeley Laboratory.

2. 16 Aug. 1974, AEC Division of Inspection Report, p. 5. U.S. Department of Energy Archives. "Sanitized" copy obtained from Eileen Welsome.

3. Earlier, in the report of the AEC review board which recommended creation of the advisory committee, Gregg had warned: "A policy of secrecy in science is neither personally courageous nor politically wise." 20 June 1947, "Report of the Board of Review," Record Group 77, File 319.1, National Archives.

THE NEW YORK TIMES OP-ED THURSDAY, JANUARY 13, 1994

Doctors of Death

By Gregg Herken
and James David

WASHINGTON

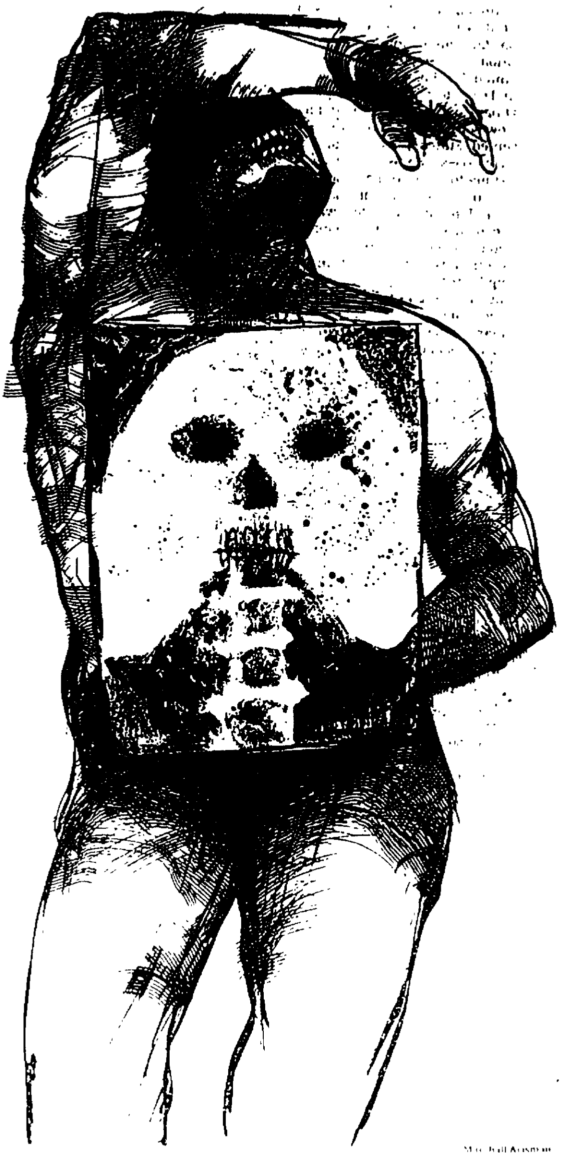
Reports of Government radiation experiments on unwitting Americans during the cold war, though shocking, have overlooked an important and sinister element. Some of the plutonium injections and X-rays were performed not only for medical research but also to study potential military applications of radiological poisons. The doctors who carried out some of the experiments were interested not only in saving lives but in taking them.

The work of two physicians mentioned in news accounts, Joseph G. Hamilton and Robert S. Stone, deserve further scrutiny. Dr. Hamilton, a neurologist at the University of California Hospital in San Francisco, was one of the first doctors to use radioactive tracers in medical research in the 1930's. Dr. Stone, a radiologist at the same hospital, was chosen by the Army in 1942 to monitor the health of people working on the atomic bomb.

From 1942 to 1946, Dr. Stone exposed 32 dying patients to powerful X-rays to examine radiation's effect on the body. Such information was needed to develop treatments for the inevitable victims of radiation accidents at the bomb factories that were proliferating around the country. During the war years, Dr. Hamilton fed plutonium to rats in a similar effort to find out where it went in their bodies.

Both men became intrigued with another obvious application of their research: using deliberate contamination with radiation as a weapon of war. As early as the spring of 1943 they discussed with the Army killing an unspecified number of the enemy by poisoning food or water with radioactive strontium.

Sinister military experiments of the cold war.



Marshall Arisman

While the success of the atomic bomb diverted attention from this project, the two doctors remained enthusiastic about radiological warfare. "If we were directed tomorrow to reorganize our fission product work to the military needs of radioactive warfare," Dr. Hamilton advised the Army in January 1945, "almost all of our past and present efforts with fission products would be directly applicable."

His rat experiments having proved inconclusive for humans, Dr. Hamilton notified the Army on May 10, 1945, that he was awaiting a "suitable patient." A few days later, he found Albert Stevens, a house painter from Healdsburg, Calif., who was believed to be suffering from terminal stomach cancer. On May 14, Mr. Stevens was injected with what one of Dr. Hamilton's colleagues subsequently described as "many times the so-called lethal textbook dose" of plutonium. On May 18, a biopsy showed that the patient had an ulcer, not cancer.

Although Dr. Hamilton never told Mr. Stevens the nature of the experiment in which he was the guinea pig, the doctor closely monitored the plutonium his patient excreted. Mr. Stevens dutifully collected his urine and feces in glass bottles and stored them in a shed behind his house.

The end of the war did nothing to stem Dr. Hamilton's interest in radiological warfare. In April 1946, he again reported to the Army on potential military applications of his research. Three days later, he injected plutonium into a boy with terminal bone cancer. But the Army was beginning to get squeamish. In November, when Dr. Hamilton asked for more plutonium, the Army denied the request. In December, it advised him to "take immediate action to stop this work."

A week later, Dr. Hamilton sent the Army a secret report on radiological warfare in which he proposed using radioactive smoke as a killing agent.

"Such a type of preparation would appear well adapted for producing fission product aerosols to subject urban populations to fission product poisoning by inhalation," he wrote. "It can be well imagined the degree of consternation, as well as fear and apprehension, that such an agent would produce upon a large urban population after its initial use." Countermeasures and decontamination, he concluded, would be "almost hopeless."

The following month, the Atomic Energy Commission, the civilian agency that had meanwhile assumed responsibility for atomic weapons from the Army, sent a representative to talk to Dr. Hamilton about his proposed future human experiments. The intermediary reported that "Dr. Hamilton's plan for conducting the research should be satisfactory" to the commission

In July 1947, Elmer Allen, an African American railroad porter believed to be suffering from bone cancer, became the third and last subject to be injected with plutonium at the University of California Hospital. Fragmentary records indicate that other radioactive substances — including polonium, americium and radium — were injected into other as-yet-unidentified human subjects.

By 1948, protests against human radiation experiments were being raised in the A.E.C. That fall, the chairman of the commission's advisory committee on biology and medicine, outraged that Dr. Stone was giving whole-body X-rays to arthritis patients, notified the radiologist that the commission's experts "do not wish to collaborate in clinical investigations with physicians in whose considered judgment they do not have confidence."

In July 1949, the head of the commission's division of biology and medicine wrote Dr. Stone that he was "taking an increasingly dim view" of human experimentation. Undeterred, Dr. Stone defended the radiation experiments on the grounds that he and his colleagues, not the commission, had the right to select the patients and choose the type of therapy.

The evidence suggests that Dr. Stone continued his work at Laguna Honda, a county-run home for the elderly in San Francisco, with financial support from the University of California.

Dr. Hamilton also continued experimenting long after the war. By the late 1940's, he had helped persuade the Army to carry out "pilot experiments on a fairly large scale" of his radioactive aerosol idea. In October 1949, the Army conducted the first of six tests of radiological munitions at Dugway Proving Grounds in Utah. Dr. Hamilton was chairman of the panel of experts who advised the Army on the tests.

A year later, he wrote the Atomic Energy Commission about the possibility of finding healthy human volunteers to inhale near-lethal doses of radioactive aerosols — acknowledging that his proposed experiment had "a little of the Buchenwald touch." Apparently, he found no volunteers. As late as 1952, he wrote that he was "most desirous that the [radiological warfare] program continue to develop as rapidly as possible."

Irony had the last word. In 1964, two years before his death, Dr. Stone received an A.E.C. citation for "inspired, effective and pioneering leadership." Dr. Hamilton died in 1957, at the age of 49, of a rare form of leukemia almost certainly caused by exposure to radiation. Albert Stevens, the house painter who was his first human subject, died of heart disease [illegible] at age [illegible]

Gregg Herken, who is writing a biography of the physicist Ernest Lawrence, is chairman of the space history department at the Smithsonian's National Air and Space Museum. James David is a researcher in the department.

WRITTEN STATEMENT OF JAMES DAVID
RESEARCHER, DEPARTMENT OF SPACE HISTORY
NATIONAL AIR & SPACE MUSEUM, SMITHSONIAN INSTITUTION
FEBRUARY 2, 1994

This statement is adjunct to that of Dr. Gregg Herken, Chairman of the Space History Department, National Air & Space Museum. His statement focuses on the historical background of the human radiation experiments, as discerned from documentary evidence uncovered in three years of research into the life of physicist Ernest Lawrence. The remaining questions concerning the experiments and where the answers thereto might be found are discussed in this statement.

The first of the remaining questions is obvious: What experiments have not been disclosed? Several experiments have been public knowledge for some years. Most, if not all, of these are described in the November 1986 report of the House Subcommittee on Energy Conservation and Power, "American Nuclear Guinea Pigs: Three Decades of Radiation Experiments on U.S. Citizens." In recent months, however, information on several previously undisclosed experiments has come to light. All indications are that additional experiments have not been reported. For example, the formerly classified official Manhattan Engineering District (MED) history written in December 1946 states that "Studies are being conducted on the injection of non-toxic amounts of plutonium, polonium, radium, uranium and possibly lead into human subjects in order to determine the excretion rates in the urine and feces of these substances.... These studies are not ready to report at the present time." In the formerly classified supplement to this history written in July 1947, the biomedical research projects approved by the MED in December 1946 and recommended for continuation by its successor, the Atomic Energy Commission (AEC), are set forth. The University of Rochester's approved program lists, among other things, the "study of the metabolism of plutonium, polonium, radium, etc. in human subject [sic]." The University of California's approved program includes studies on the metabolism of plutonium, uranium, radium, actinium, americium, curium, and fission products in animals and man.

The above-mentioned plutonium injections are presumably the same eighteen that, in some respects, are well-documented now. Although "American Nuclear Guinea Pigs: Three Decades of Radiation Experiments on U.S. Citizens" describes six human injections of uranium salts at the University of Rochester in 1946 and 1947, it is unclear whether these six are the uranium injections referred to in the official histories. At best, only very fragmentary information on the injections of the other radioactive materials set forth in the official histories has been uncovered.

The remaining questions relate to all the experiments. Who proposed them and why? Who approved them and why? To what extent did officials in various government agencies know of them? Was there any informed consent by the human subjects and, if not, why not? Even with respect to the experiments that have been public knowledge for some time (for example, the eighteen plutonium injections), the answers to these questions are very incomplete.

Concerning where the answers to the remaining questions might be found, it should be noted at the outset that most of the information obtained thus far on human radiation experiments, as well as the considerable information needed to complete the story, comes from documentary evidence. Most of the participants are no longer living.

The most important documentary evidence is in the records of certain government agencies, most notably the MED and AEC. With respect to MED records, those of the Health Division of the Metallurgical Laboratory in Chicago (headed by Dr. Robert Stone) and the Medical Section (headed by Colonel Stafford Warren) should contain most of the relevant information, as these two offices supervised the vast majority of biomedical research of the MED. Additionally, because some experiments were conducted at MED facilities such as the Clinton Laboratory in Oak Ridge, the records of these facilities merit examination. Currently, the voluminous records of the MED are held by a number of National Archives facilities, Federal records centers, and Department of Energy (DOE) facilities around the nation. With few exceptions, these repositories do not have comprehensive finding aids to their collections, which makes their review even more time-consuming than it would otherwise be. Moreover, many of the records are still classified.

With respect to AEC records, those of the Division of Biology and Medicine (DBM) and its Advisory Committee on Biology and Medicine (ACBM) in all likelihood contain considerable relevant information, because the vast majority of biomedical research of the AEC was supervised through this office. It is possible, however, that other AEC offices (for example, the Division of Military Application or DMA) were involved to some degree in human radiation experiments. Also, since some of the experiments were conducted at AEC facilities such as Los Alamos Laboratory, the records of these facilities need to be reviewed. Most of the records of the DBM, ACBM, and DMA are still held by DOE, although the Federal records center in Suitland, Maryland, contains some DMA records from the 1940s and 1950s. The records of individual AEC facilities are for the most part also still held by DOE, although in some cases they have been transferred to the appropriate regional National Archives or Federal records center. It is unlikely comprehensive finding aids exist for many of these records. In any event, they are almost entirely classified.

Additional records having pertinent information are those of the various contractors to the MED and AEC. Two key contractors, for example, were the University of California Radiation Laboratory and the University of Rochester, both of which did extensive biomedical research for the MED and the AEC. In the case of the former, almost all the records have been transferred to the regional National Archives and Federal records center in San Bruno, California. Good finding aids exist to the collections, and the vast majority of records have been declassified. Nonetheless, there are considerable gaps in these records and by no means do they furnish the entire history of experiments conducted by this institution. In the case of the records of the University of Rochester, as well as the many other biomedical research contractors to the MED and AEC, it is not known where the records are located. An additional complication arises with respect to contractors. In some cases experiments were not done at the contractor's facility but at some other institution. For example, the three plutonium injections performed at the direction of Dr. Joseph Hamilton of the University of California Radiation Laboratory between May 1945 and July 1947 were actually carried out at the University of California at San Francisco Hospital. Consequently, the records of these institutions merit examination as well.

Other possible valuable records are in the personal papers of some of the participants in the MED and AEC's biomedical research program. For example, the personal papers of Stafford Warren are located at the University of California at Los Angeles, and those of Dr. Shields Warren (the head of the DBM in the late 1940s and early 1950s) are located at Harvard. It is unknown, however, whether either contains any material on human radiation experiments. The existence of other collections of personal papers, as well as their scope, needs to be investigated. Unfortunately, in some cases it appears that the personal papers of key principals seem to have been lost or destroyed. One prominent example involves the personal papers of Dr. Hamilton, who spent nearly twenty years conducting biomedical research involving radioactive substances. With the exception of a very small number of items at the University of California and in the collections of the University of California Radiation Laboratory, his records simply cannot be located.

Mr. BRYANT. Thank you.

Dr. RUNDO.

STATEMENT OF DR. JOHN RUNDO, BIOPHYSICIST, ARGONNE NATIONAL LABORATORIES

Dr. RUNDO. Mr. Chairman, my name is John Rundo; I am a retired scientist from Argonne National Lab. I retired just over 2 years ago as a senior biophysicist which I had been since 1974.

I had previously worked for 20 years in England at the Atomic Energy Research establishment. Both at Argonne and at Harwell, by far the largest part of my professional life has been devoted to research involving radioactivity in man.

My task here is, at least initially, to explain Argonne's involvement in the followup studies of three of the persons who had been injected with plutonium in the 1940's. In addition to the 3 that Dr. Herken has referred to, there were another 3 at the University of Chicago—not Argonne National Lab—but at the University of Chicago, and 12 were at the University of Rochester.

In 1973, we learned that several, 4 to be precise, of those 18 people were still alive. Now, the original purpose of the experiments, as we understood it, was to determine the excretion rate of a known amount of plutonium in man, and by "man" I mean the species man, which includes women, of course.

So learning that four of them were still alive, we thought it would be a worthwhile experiment—and perhaps I shouldn't say experiment, perhaps I should call it study—to see if we could determine the excretion rate 27 years after the injection, because the early studies had gone on only for about 4½ months.

Using those early studies, and the results of them, expressions had been determined which are called Langham equations after the name of the scientist in charge of the procedures, which related the excretion rate to the body content, and these were used to determine the body contents of workers in the atomic bomb project. This was information that had been vitally needed and this is what initiated or laid the foundations to perform the experiments, unethical though they may have been.

They were certainly successful in getting the information they needed. They didn't expect, however, that any or many of these patients would live more than about 10 years.

So we contacted three of the four people, and requested that they cooperate with us. We asked them—I shouldn't say we requested—we asked them if they would cooperate with us and agree to hospitalization on a metabolic ward which they had experienced before. And they agreed.

So this was done, and we were able to get urine and feces collected for various periods and we analyzed them in my lab, or one of my labs. The results that we got were somewhat surprising. They are tabulated in full in the testimony in a table, and we found that the excretion rates were much higher than would be expected if you extended the equation that had been derived in the 1940's from the early data.

When I say much higher, I am talking about an order of magnitude, about 10 times higher to even 20 and 40 times higher, depending on the individual, and depending on whether you are talking about urinary excretion or fecal excretion. So this was a very important finding as far as we were concerned, because it meant that if you used the old expression to calculate the body content of someone who had been exposed 25 or 30 years before, the answer you got would have been wrong and it would have been much too high by a factor of about 10.

We published all of this, and we did some other studies of the plutonium cases. For example, we got permission from next of kin and exhumed four of the bodies, and did some studies on these. These are all detailed in my full testimony, and I don't think I have time to go into the details. If you wish to know and ask, I will certainly tell you.

So to conclude, we got all of this information and now there is the question of what harm or benefits there might have been. First of all, I have to say there were clearly no benefits to the persons injected.

But equally, we do not believe that there was any harm, at least not physical bodily harm. There was perhaps what Representative Markey called "dignity injury," or dignity harm to those who were told eventually, these people who survived.

As far as benefits are concerned, well, of course, there were benefits to the scientific community. There are benefits to people who work with plutonium, because we are able to estimate their body content of plutonium at an early time, an early stage before it gets too high, based on the early data and using our late data, we can also confirm or otherwise whether someone who perhaps claims injury from plutonium at a late time, we can determine the body content of plutonium from the excretion of plutonium, if any.

Now, I think that is all I will say about plutonium. I will be happy to answer any questions you may have.

I would just like to spend a few minutes now, a very few minutes, talking or mentioning a number of other studies in which radioactive materials were administered to humans by researchers, and I am not referring to medical treatment or medical uses.

First of all, I would like to point out that many of these studies were the researchers themselves were the subjects, the experimenters were the subjects, and that is a very important thing. In fact, of the 10 that I list, I think in 6 cases the experimenters were the subjects. So although——

Mr. BRYANT. The experimenters were subjects?

Dr. RUNDO. Yes, they were the subjects. So while they may not have signed an informed consent form, one can assume there was implied informed consent since they planned and carried out the experiments themselves on themselves.

The radionuclides in general were short lived and in small quantities, largely because in the 1950's when most of these experiments started, equipment for measuring radioactivity in people had become so sensitive that unless you gave a small amount, you swamped your measuring equipment. It couldn't cope with very large amounts of radioactivity.

I would say that of all of the cases that I have listed, the 10 different experiments, the radiation doses were so small that no radiation effects would be expected, and none have been reported, with one notable exception. This was an experiment which admittedly was not done, as far as I know, with Government support, in the early 1930's, when 41 patients at a hospital in Illinois were injected with large amounts of radium. Those experiments yielded enormously important information about the metabolism of radium, but they also caused in a number of cases, and I don't have the figures in front of me, but I think it is five cases of bone sarcoma, and at least one case of a cancer in one of the cavities of the head, either the sinuses around the nose or the mastoid behind the ear. That concludes my testimony.

Thank you.

[The prepared statement of Dr. Rundo follows:]

House of Representatives Judiciary Committee
Sub-Committee on Administrative Law and Governmental Relations

Summary of Testimony of John Rundo, Ph.D., D.Sc.

I retired in 1991 from Argonne National Laboratory (ANL) as a Senior Biophysicist after 22 years employment. I had previously worked for 20 years at the Atomic Energy Research Establishment at Harwell in England. By far the largest part of my professional life has been devoted to research involving radioactivity in man.

In 1973 scientists under my direct supervision determined the plutonium excretion rates of three persons who had been injected with plutonium in the 1940s. The results are tabulated in my full testimony. Both the urinary and fecal excretion rates for two persons were much higher than predicted by the equations used to relate body contents to the excretion rates. Those prediction equations had been derived from the urinary and fecal excretion rates of all the persons injected, including these two, using the data obtained in the first 4½ months after injection. Excretion of plutonium by the third person was too low to be used.

The macroscopic and microscopic distributions of injected plutonium in the skeleton of an exhumed body were determined.

Regarding the question of harm, the evidence is that all the persons injected with plutonium died of causes unrelated to their injected radioactivity. There were no bone or liver cancers, the expected biological effects of injected plutonium.

The purpose of the injections (not done at ANL) was to enable health physicists to determine the body contents of plutonium in workers from their urinary excretion rates. This information was urgently needed in the 1940s when many persons were exposed occupationally to plutonium and the results from animal studies were strongly species-dependent. Thus, these persons derived benefit from the injections. A benefit of the follow-up studies in 1973 is that it is now possible to use the urinary excretion to determine with some confidence the body content of plutonium in an individual as long as 30 years after intake to the blood. This could be important from a legal standpoint. To summarize, the result of the follow-up studies has been to add significantly to human knowledge about the biological behavior of an element which may well play an important role in world-wide energy production in the future.

In my full testimony, I list a number of published studies in which radioactive materials were administered to humans by researchers at various institutions. In many of these studies the researchers themselves were the subjects; they are identified with an asterisk. The radionuclides and numbers of subjects were: palladium-103 (1 man*); niobium-93 (1 man*); radium-226 (41 hospital patients); radium-226 (2 men*); radon-222 (1 man*, 1 woman*); sodium-24 (1 man*, 2 persons); radium-226 and strontium-85 (1 man*); potassium-42 (more than 28 persons); and radium-224 and thorium-234 by ingestion (3 men, 3 women) and by injection (4 men, 2 women). In almost every case the absorbed radiation doses were so small that no radiation effects would be expected. The injections of radium-226 in 41 hospital patients were a notable exception to this. My testimony concludes with a list of references to the published literature describing the experiments.

House of Representatives Judiciary Committee
Sub-Committee on Administrative Law and Governmental Relations

Testimony of John Rundo, Ph.D., D.Sc.

PERSONAL BACKGROUND AND EXPERTISE

My name is John Rundo; I am married and have three grown children. I was born and educated in England, and I graduated in 1949 with the degree of B.Sc. in chemistry from the University of London. That year, I joined the Health Physics Division of the Atomic Energy Research Establishment, Harwell in England where I remained until 1969, except for a three-year period (1952-1955) when I was on leave of absence at the Finsen Institute in Copenhagen, Denmark. The University of London awarded me the degree of Ph.D. in radiation biophysics for a thesis on my work in Copenhagen on measurements and dosimetry of thorium [a radioactive element] in man.

In 1969 I joined the Radiological Physics Division of Argonne National Laboratory (ANL) as a Biophysicist, to participate in the work of the newly formed Center for Human Radiobiology (CHR), the initial purpose of which was to consolidate and continue studies of the late effects of radium in man ("dial painters", who were exposed occupationally, and others who were administered radium on medical grounds) in a long-term project funded by the U.S. Atomic Energy Commission and its successors. My original role was to lead a group responsible for making measurements of the radium contents of the persons under study. Later my responsibilities were broadened to cover all measurements of radioactivity. By 1973 I had more than 70 publications in the open literature, dealing with the measurement and metabolism of radioactive isotopes in man. In 1974, I was promoted to Senior Biophysicist, a title I held until my retirement in 1991; by that time I had roughly doubled the number of publications. In 1980, I was awarded the degree of D.Sc. (a "higher" doctorate, not an honorary degree) by the University of London, based on my published work in the field of Low-level Radioactivity in Man. I must emphasize that I am not a physician. On a part-time basis, I continue with some professional activities (e.g., consulting) in my retirement.

I should say that preparation of this testimony has been hampered by the unavailability of all the records of the CHR (including the involvement in the plutonium injection cases) consequent upon the closing of the radium project.

Before discussing the involvement of Argonne National Laboratory with the persons injected with plutonium, I would like to make two points. Firstly, to the best of my knowledge, no persons were ever injected with plutonium at Argonne National Laboratory, and secondly, I have never conducted, nor would I ever conduct, experiments on humans without first obtaining their informed consent.

INVOLVEMENT WITH PLUTONIUM INJECTION CASES

Because of the expertise existing in my CHR group in the area of radiochemical analysis of biological samples for very low levels of radioactivity, and appropriate expertise in other groups of the CHR, we were the laboratory of choice to study some of the persons who had been injected with plutonium in the 1940s. In 1973, we were advised by Dr. Patricia Durbin of Lawrence Berkeley Laboratory that some of the people were still living and we were able to locate two of the three in the Rochester area through the courtesy of Dr. Christine Waterhouse of Strong Memorial Hospital, Rochester, in whose care they were. They agreed to our request that they be hospitalized on a metabolic ward for collection of all excreta for analysis by us. I do not know what background information they were given.

A third subject was located by us in a different part of the country and he also agreed to participate. On the way to Rochester, this man visited Argonne National Laboratory. Records indicate that unsuccessful attempts were made to detect plutonium in the body by external measurement while he was at Argonne.

The three subjects were hospitalized on the metabolic ward for various periods (at least eight days); all urine and feces and some blood samples were collected and sent to Argonne for radiochemical analysis. [During the hospital stay of one subject, I and a colleague took special equipment to Rochester and made an attempt to detect plutonium and americium (a product of the radioactive decay of one isotope of plutonium) in the body by external measurements. We were unsuccessful in this endeavor.]

RESULTS AND COMMENTS

Table 1. Measured excretion rates of plutonium.

Subject	Days since injection	Urinary excretion		Fecal excretion	
		days sampled	pCi/day*	days sampled	pCi/day*
Mr. E.A.	9,474	3	0.06	-	No analyses
Mrs.E.C.	9,934	14	7.60	6	3.17
Mr. J.M.	10,008	8	4.68	8	1.77

*1 pCi (picocurie) corresponds to a disintegration rate of 2.22 atoms per minute. It is the same as a trillionth of a curie, which itself is the radioactivity of one gram of radium.

The results of the analyses of the excreta are summarized in Table 1. The urinary excretion rate for Mr. E.A. was so low that it was necessary to process the whole of a day's collection and count the extracted activity for about a week.

This is why only three urine samples and no fecal samples were analyzed. The amount injected into this man's left calf muscle was less than one third of the amounts injected intravenously into the two other persons, and much of it remained at the site of injection after the leg was amputated. Almost half of the amount injected was found in tissue around the site of injection; there may very well have been more in the surrounding muscle. These findings introduced a large element of uncertainty into our knowledge of the actual amount in Mr. E.A.

For the other two subjects the activity was relatively easy to measure. The urinary excretion rates for these two persons were six to twelve times higher than predicted by the equation then used to calculate body contents from urinary excretion rates, while the fecal excretion rates were 19 to 38 times higher than the similarly predicted rates. Note that those prediction equations were derived from the urinary and fecal excretion rates of all the persons injected, including these two, using the data obtained in the first 4½ months after injection. They were certainly valid for that early time period, but should not be used at very long times after acquisition.

The blood samples from these two persons were also analyzed for plutonium, with the following results:

Mrs.E.C.	97 pCi/liter plasma
Mr. J.M.	39 pCi/liter plasma

These data can be used with the excretion results to calculate a quantity called the excretory plasma clearance; this number reflects the rate at which plutonium is removed from the blood to the excreta. We obtained 0.11 liter/day and 0.17 liter/day for the two persons, respectively; these results were similar to those found shortly after injection.

To the best of my knowledge, all the results for these two persons were given to Dr. Christine Waterhouse in Rochester; I remember having at least one telephone conversation with her, but I cannot recall the matter we discussed. The records show that the results for Mr. E.A. were given to his physician (name unknown to me). I do not know what these physicians told their patients.

The excretion results have been published in conference proceedings[1]; the results of the blood analyses were presented at a scientific meeting and only the abstract has appeared in print[2].

OTHER STUDIES AT ANL OF THE PLUTONIUM INJECTION CASES

Some other studies of the plutonium injection cases were made in the Center for Human Radiobiology. With the permission of their next-of-kin, the remains of four of the persons who had been injected with plutonium were exhumed for analysis of the skeleton to determine the retention, and also for examination by autoradiography to determine the microscopic distribution of the plutonium in the skeleton. The skeletons of two of the four had suffered so much natural decomposition after burial that they could not provide much information. A third person had been cremated. The fourth person, a young woman with Cushing's syndrome, had died at age 20 some 17 months after injection in November 1945 with 0.3 microcurie* plutonium-239. The results of the analyses were presented at scientific meetings and have been published in the proceedings[3,4]. The hair of this woman was also found to contain plutonium and the variations in the concentration along the hair were shown to match the contemporary levels in the blood[5].

RISKS AND BENEFITS

Because of the toxicity of plutonium, an important question is whether any of the 18 persons who were injected with the element suffered any harm as a result. The known effects of internal alpha-particle emitting radioactivity in man are cancers of the bone (from radium) or liver (from thorium administered in the form of Thorotrast) and possibly leukemias or anemias (from very high doses of radium). Causes of death of 14 of the 18 plutonium-injected persons (the other four were still alive) were reported at a meeting held in October 1975 and the paper was published in the proceedings.[6] I can do no better than to quote from the abstract of the paper: "The liver doses do not appear to be high enough to be carcinogenic, but comparison of the bone-surface doses with radium doses that have induced bone tumors indicate that six of these cases have received doses high enough to be considered carcinogenic. However, no bone tumors have yet appeared." Those members of the group who were still alive in 1975 have now died. I am not aware that any had a bone cancer. Thus, three persons (I exclude Mr. E.A. because the amount injected was much less and was at least roughly halved by the amputation) survived about 30 years or more after injection with about 0.3 microcurie (about 5 microgram) plutonium-239, a substance often referred to as "the most dangerous substance known to man." The absence of a biological effect shows that the protection standard had been set conservatively.

There are two important questions concerning possible benefits of the injections or of the follow-up studies. It has to be understood that the purpose of the injections was to determine the relationship between the body content of plutonium and its excretion rate, especially the urinary excretion rate. This relationship must be known to permit calculation of the body content. Those members of the general public who worked with plutonium, whether in the laboratory or in bomb-manufacturing plants, derived great benefit from the results of the injections, in that their body contents of plutonium could be estimated with reasonable confidence by their health physicists. "Action levels" were set for the urinary excretion rate (at which point further exposure was stopped), based on the known excretion patterns, and programs of regular urine sampling and analysis resulted in early indications of significant body contents.

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*A microcurie is a millionth of a curie, which is the radioactivity of 1 gram of radium. 16 grams of plutonium-239 have a radioactivity equal to 1 curie.

As far as the follow-up studies are concerned, I note the following benefits. One result of our findings was that the radiochemists at Los Alamos National Laboratory reviewed their results from 1950, and detected some errors associated with a change in the analytical method. When the urinary excretion results for 1950 were corrected, they gave values which were higher than our results, as would be expected. The originally published (erroneous) results for 1950 were actually lower than our results for 1973.[7] A less obvious benefit is that it is now possible to use the urinary excretion to determine with some confidence the body content of plutonium in an individual as long as 30 years after intake to the blood. Another benefit is that these follow-up studies and the scientific enquiry they engendered, have resulted in a much better understanding of the detailed behavior of plutonium in the human skeleton[3,4], and have provided evidence that no correlation exists between cause of death and injected plutonium.[6] To summarize, the result of the follow-up studies has been to add significantly to human knowledge about the biological behavior of an element which may well play an important role in world-wide energy production in the future.

OTHER TESTS INVOLVING HUMAN EXPOSURE TO RADIOACTIVITY

I know of several experiments that have been carried out at various times in the past in which radioactive materials were administered to people. However, with two exceptions, my knowledge is limited to what has been presented at scientific meetings or published in the open literature, so I am not able to give details. I should emphasize that, with one notable exception, I specifically exclude those cases where administration of radioactivity was for medical purposes. The three exceptions that I mentioned are as follows.

In 1969, at the time I immigrated to the United States I had in my lungs a small amount of protactinium-233 that I had inhaled while at Harwell in England. The experiment was designed by me and approved by the local Human Uses Committee. The purpose was to provide calibration possibilities for the assay of plutonium in the lung by external counting. At that time the only Laboratory that I knew of in this country with any capability for that kind of measurement was Los Alamos Scientific (now National) Laboratory and I travelled there for them to take advantage of the situation. I am not aware of any publication of the results. In the 1970s on separate occasions, I and a colleague inhaled small amounts of palladium-103 and niobium-93, respectively, at Harwell for the same purpose. These experiments were certainly conducted with informed consent.

The single exception in connection with medical purposes, mentioned above, was in 1931 when 41 patients at the Elgin State Hospital in Illinois were injected with very large amounts of radium (between 70 micrograms and 450 micrograms) as a putative treatment for schizophrenia. This group of patients yielded important data on the long-term retention of radium in man[9,10], comparable to the importance of the data obtained from the plutonium injection studies.

By the mid- to late 1950s, measuring equipment had become so sensitive that the presence in a person of more than a few microcuries of a gamma-ray emitter overwhelmed the recording equipment; this limited the amount that could be administered in most cases. By "a few microcuries", I mean in the range of 1-10. I should also say that in a number of the experimental studies outlined below, the subjects receiving radioactivity were the experimenters themselves.

I now list in chronological order the studies that I know of through publications in the literature where a radioactive substance was administered to one or more volunteers for research purposes. The earliest report is from 1915 when a paper appeared describing the fate of radium administered both by intravenous injection of 100 micrograms on two separate occasions in one of the authors, and by mouth of 50 micrograms also twice in another author[11]. Since two of the authors of the paper were the subjects we can safely assume that there was informed consent. (I might note in passing that about 50 years later these two men retained 0.7 percent and 0.15 percent of the amounts administered, respectively, the difference arising because only a fraction of ingested radium is absorbed into the blood.)

Turning to more recent times, I note that a study was published in 1951, in which two persons inhaled radon at the Health and Safety Division (Laboratory?) of the Atomic Energy Commission's New York Operations Office[12]. The purpose was to determine the retention of inhaled radon, and the delay needed between work with radium and breath sampling for estimation of radium content. On several occasions, the subjects inhaled radon at a concentration of "about 5×10^{-10} curies per liter" (i.e., about 500 pCi per liter) for periods "from 20 minutes to 8½ hours." Thus, there was more than one exposure of two individuals. The question of informed consent was not mentioned, but the subjects were among the researchers themselves.

In 1955 a paper was published[13] which had been presented at the International Congress of Radiology held in 1953 in Copenhagen, Denmark, which I attended. In this work, three persons were administered "a few microcuries" of sodium-24 (half-life 15 hours). They were identified by their initials: L.D.M. (the senior author of the paper), T.T. and J.W. There was no mention of the route of administration or of informed consent.

In about 1961, radium and strontium-85 were injected into an 80-year old man to determine the early retention[14]. I do not know the amounts injected, but there must have been informed consent because the subject was listed as a co-author.

Several papers published between 1958 and 1962 refer to the use of the short-lived radioactive potassium-42 as a calibrator for the measurement of naturally radioactive potassium in the human body. (I had used this on myself and colleagues in Copenhagen in 1953.) The first reports[15] were not specific, but the second[16] described the measurement and calibration procedure but without specifying the amounts. It was stated only that "a solution containing a small amount of K^{42} is divided into equal parts; one of these is administered to the subject and the other is diluted . . ." The third publication[17] described the experimental procedure in more detail; potassium-42 was administered to as many as 28 persons and numerous measurements were made of their body radioactivity in different measuring systems. There was no mention of informed consent.

Finally, at a 1967 meeting in Sun Valley, Idaho, a report was given of experiments in which mock luminous paint containing short-lived radioactive isotopes of radium and thorium was ingested by three men and three women, all aged between 63 and 83, and the same isotopes were injected intravenously in a similar group[18]. The purposes of the experiment were to determine the fractions of radium and thorium that are absorbed into the blood after ingestion, and the retentions of these elements after injection The report gives no information on the amounts of either radionuclide and informed consent was not mentioned.

I cannot think of other experiments of this nature, although there may well have been some, and this concludes my testimony.

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Mr. BRYANT. Thank you. Dr. Rall.

STATEMENT OF DR. DAVID P. RALL, CHAIRMAN, COMMITTEE TO SURVEY THE HEALTH EFFECTS OF MUSTARD GAS AND LEWISITE, INSTITUTE OF MEDICINE

Dr. RALL. Thank you very much, Mr. Chairman.

I am Dr. David Rall. I am testifying today because I chaired an Institute of Medicine, National Academy of Sciences committee that looked at the health effects of mustard gas and lewisite, a study requested by the Department of Veterans Affairs. You have summaries of our report and you have my prepared statement, and I shall try to be brief.

Our study involved a review of the literature, a search for experimental protocols, many largely fruitless freedom of information requests to the Department of Defense and a public hearing process involving over 250 affected veterans. The study director, Dr. Constance Perker who is behind me, still receives telephone calls from those veterans, and I might say in general, their testimony was corroborated by the records we were able to discover.

These records were of the actual protocols used in the chamber tests from the Naval Research Laboratory in Anacostia. We were able to determine that at least 2,500 men were subject to chamber tests and at least 1,500 participated in field tests. This is the absolute number, because we can document these and yet we were only able to look at perhaps one-eighth of the effort that was going on.

We also were able to obtain the protocols which outlined recruiting methods and other key information. These are appendix D of our report, and we furnished you with a copy of this.

I might say that Mr. Schnurman described in real detail what happened to those young men.

First, the men were deliberately mislead about what they were being exposed to until they had been through at least one chamber trial.

Second, the official documents warned those conducting the test not to mistake symptoms such as laryngitis or conjunctivitis for gas symptoms, despite the fact that these were, in fact, known consequences of sulfur mustard exposure.

Third, official documents guided those in charge to dress down any subject who wanted to withdraw from the experiments. Veterans told us that this dressing down often took the form of overt threats.

Finally, the men, as has been suggested before, were ordered never to reveal their participation to anyone upon threat of imprisonment.

After the subjects were released from the chamber test, they were sent home on leave and then off to war. No attempts were made by the Government to follow the men's health status. This in spite of the fact that the military doctors had published in open literature in 1933 that chronic bronchitis, chronic asthma, emphysema and certain eye problems resulted from sulfur mustard exposure.

So little is known about the field tests that we really cannot comment on them. It is known that there were eye exposures.

About the ethics of these experiments, many would argue that it was wartime and because they predated the Nuremberg Code, no formal code of ethics had been formalized. It is, therefore, difficult to say clearly what the standards were in early 1940.

As a medical student, I volunteered as a human subject for medical research in the mid- and late 1940's. I knew what the research entailed and I had the right to withdraw from the experiment at any time.

Professor Jay Katz from Yale, a prominent bioethicist, took the position that the World War II mustard gas experiments did violate ethical standards and the Government should be held accountable. It should be pointed out that the standards of the day were held up at Nuremberg by the U.S. Military Tribunal involved in informed consent and they were judged as the standard.

Our committee members expressed differing opinions on the ethical issues presented in these experiments. The consensus was that the combination of misleading the subjects, exposing them to high levels of toxic substances, demanding that they remain in the experiments and keep it secret for decades, and on top of that, neglecting to follow the subjects' health status required, at the very least, comment.

We also believe these abuses justified our recommendations to Government agencies involved to do everything possible to aid these men now and to ensure that adequate protections equal to those in civilian research arena were in place for present and future human subjects in military experiments. We recommended that the Department of Defense attempt to identify former human subjects and work with the VA to notify and medically evaluate those that were found.

The committee recommended that the VA and the Department of Defense widely advertise that any vows of secrecy were no longer binding and this has been done. In preference to our report, further we asked that each veteran who served as a human subject be honored for his sacrifice and any continuing military research with human subjects be held to the same standards and guidelines applicable to civilian research, specifically the inclusion of outside civilians, be they physicians or not, on all research protocol review panels.

Thank you very much.

[The prepared statement of Dr. Rall follows:]

TESTIMONY REGARDING INSTITUTE OF MEDICINE REPORT,

VETERANS AT RISK: THE HEALTH EFFECTS OF MUSTARD GAS AND LEWISITE.

Prepared for:

United States House of Representatives
Judiciary Committee
Subcommittee on Administrative Law and Governmental Relations

February 2, 1994

Testimony given by:

David P. Rall, M.D., Ph.D.
Chairman
Committee to Survey the Health Effects of Mustard Gas and Lewisite
Institute of Medicine

Good morning Mr. Chairman and members of the Committee. I am Dr. David Rall and am testifying because I chaired an Institute of Medicine committee that surveyed the health effects of exposure to mustard gas and Lewisite--a study that was requested by the Department of Veterans Affairs when it was revealed that World War II servicemen were used as human subjects in gas chamber and field tests of these chemical warfare agents. I have brought with me summaries of our report, ***Veterans at Risk: The Health Effects of Mustard Gas and Lewisite.***

In 1991, the Secretary of the Department of Veterans' Affairs (VA), Mr. Derwinski, requested the Institute of Medicine (IOM) to assemble a committee to survey the scientific and medical literature regarding mustard gas and lewisite. The purpose was to judge, on the basis of the literature, the strength of association between exposure to these agents and specific health conditions, and to identify gaps in the literature. The committee was further asked to recommend ways to reduce any gaps found. The study was requested because it had become clear that United States servicemen had been used as human subjects in a World War II testing program in which they were exposed to mustard agents (sulfur and nitrogen mustard) and lewisite. Some of these men, by 1990, were filing claims with the VA for service-related disability. Thus, an additional element of the IOM committee's statement of task was to hold public hearings through which affected veterans could inform the committee about their experiences in the tests and their subsequent health problems.

The study that resulted from this request was a difficult, but successful, one. At the time it began, the VA had already identified seven health conditions as causally related to mustard agent exposure, including chronic bronchitis, chronic asthma, laryngitis, emphysema, corneal opacities, keratitis, and chronic conjunctivitis. By the conclusion of the study, our committee was able to identify several new health conditions associated with exposure to these agents and to determine that the levels of exposure in the gas chamber and field tests conducted during World War II (and in later years) were sometimes equal to that experienced by soldiers in the battles of World War I.

The study, however, was one in which discoveries and revelations built upon one another in a complex way. Therefore, my presentation will follow the development of the committee's work. This approach is not to inform you of the study "process", but to put into context the intricate background and underpinnings of the committee's findings and recommendations. I would also like to point out that all the committee's findings and recommendations were subjected to a rigorous review process in which the draft report was examined by 10 individuals with appropriate expertise, appointed and supervised by the National Research Council's Report Review Committee.

The IOM study began in September 1991 and the committee met for the first time in January 1992. It was clear at this first meeting that an important challenge was the state of the scientific literature. This literature was replete with information regarding the acute effects of mustard agents, but was sorely lacking in information about the long-term consequences of exposure. To counterbalance these gaps and take full advantage of the information available, the committee focused on several areas. First, the assessment of the actual exposure levels in the gas chamber and field tests became important. The committee also looked at related literature including data about second cancers resulting from the use of nitrogen mustard as a cancer chemotherapy agent. We also examined other lung irritants and the connection, or lack of one, between acute symptoms and long-term damage. Finally, the committee paid special attention to the data available from long-term follow up of chemical munitions workers and to the very few follow-up studies done with World War I mustard gas casualties. In all of their evaluations, the committee was guided by established principles of risk assessment, including dose estimation, timing of symptoms, and plausibility of biological mechanisms of injury, among others.

Between January and April 1992, the committee sought to obtain as much detail as possible regarding the experimental protocols to assess what the actual exposure levels might have been. In addition, the committee began its public hearing process in which it solicited written, oral, or public statements from veterans--over 250 veterans contacted the committee through the study director, Dr. Constance Pechura, who still receives telephone calls from affected veterans. Both these activities helped shape the report.

The committee is indebted to the Naval Research Laboratory for providing technical reports and summaries of the gas chamber tests conducted there. These documents, some of which were included in Appendix D of our report, outlined subject recruiting methods, information about the concentrations of agents inside the gas chambers, number and length of individuals trials, as well as the variable use of "protective" clothing. These documents also made clear that the end point of the gas chamber experiments was tissue injury. These official documents strongly corroborated the veterans' own reports. We know that at least 2500 men were subjects in gas chamber tests and at least 1500 participated in field tests. These numbers, however, are from incomplete records and thus represent the absolute minimum number involved. Let me outline the experiments.

Young men in Navy boot camps were offered extra leave and "a change of scenery" if they would agree to test "summer uniforms" for a few weeks. Once at the test site, the men wore various amounts of clothing that had been chemically impregnated with substances developed to retard the penetration of mustard or other chemical agents. They were given gas masks and locked into a chamber, which was then filled with gas--most often sulfur mustard. These chambers were kept at ninety degrees Fahrenheit and sixty percent humidity. In some cases, the concentrations of sulfur mustard in the chambers would have been lethal without the gas masks. The men were required to remain in the chamber for an hour, after which they remained in the protective clothing for varying periods of time. This scenario was repeated either daily or every other day until the men's skin burned, indicating failure of the protective clothing.

Four aspects of this testing are notable in terms of research with human subjects. First, the men were deliberately misled about what they were being exposed to until after they had been through one chamber trial. Second, official documents warned those conducting tests not to mistake symptoms such as laryngitis or conjunctivitis for gas symptoms, despite the fact that these were well known consequences of sulfur mustard exposure. Third, official documents guided those in charge to "dress down" any subject who wanted to withdraw from the experiments; according to veterans' reports, this dressing down often took the form of overt threats. Finally, the men were told never to reveal their participation to anyone.

Less is known about field testing of the protective clothing. However, it is known that concentrations in field tests were also high, that some field tests were done without protective clothing or masks, and that field tests were often followed by chamber tests of the clothing worn. Subjects in field tests were most often recruited from units of the Chemical Warfare Service, including the 95th Medical Gas Treatment Battalion and others.

After the subjects were released from the chamber test sites, they were sent home for leave and, later, sent to their various wartime posts. No attempts were made by any department of the U. S. Government to follow the men's health status and, in some cases, mustard agent-related illnesses were not recorded as such in infirmary or hospital records. The IOM committee concluded that this lack of follow up was not justified by a lack of knowledge about long-term health effects of these agents, because military doctors had published in the open literature in 1933 that chronic bronchitis, chronic asthma, emphysema, corneal opacities, and chronic conjunctivitis resulted from sulfur mustard exposure.

The committee also investigated the degree to which the gas masks used prevented inhalation injuries in chamber tests and found that, even assuming a protection factor afforded by modern gas masks, inhalation injuries would have occurred. Further, the type of gas mask used in the experiments, the Navy diaphragm type, was eventually rejected by the Chemical Warfare Service because it was unacceptably leaky.

By their second meeting and public hearing in April 1992, the committee was also concerned with the potential psychological effects of the gas chamber and field tests on the human subjects and with their own responsibilities as physicians and scientists to consider the conduct of the experiments and how to communicate most effectively with the affected veterans once the study was completed. Thus, the committee sought input from an expert in the psychological effects of chemical and biological warfare environments and from experts in bioethics and risk communication. We decided to appoint a psychologist to the committee to help assess the relevant literature. The human subjects had not only been placed into highly threatening chemical warfare environments, they had also suffered real exposures to toxic substances. The committee reviewed the literature pertaining to psychological health effects of not only chemical warfare environments, but also exposures to other toxic substances, such as dioxin at Love Canal, and radioactive leaks, such as the Three Mile Island accident.

Between April and August 1992, the committee met twice to draft the report. Information about the poor safety record of chemical warfare production facilities emerged, partly due to the public hearing process and partly due to the search for additional exposure data. The committee was surprised to find that only Japan had done long-term follow-up studies with workers from chemical production facilities. To a lesser extent, Great Britain had studied such workers; the United States had not. In addition, the committee found that some servicemen, assigned to handle chemical weapons or train others in defense against them, had also suffered severe exposures. Finally, the committee heard from men who had been injured in World War II by sulfur mustard following the German bombing of the harbor in Bari, Italy, which destroyed a U.S. merchant vessel carrying a secret load of sulfur mustard munitions. The sulfur mustard leaked from the ship into the water and vaporized into the air, causing at least one thousand deaths among civilians and military personnel.

Now let me turn to the health conditions identified by the committee as causally related to exposure to mustard agents. I will also identify those conditions associated with exposure to lewisite, but the data on lewisite were quite scant. The committee's evaluation agreed with the original determination of the VA assigning a causal relationship to chronic bronchitis, chronic asthma, chronic laryngitis, emphysema, corneal opacities, keratitis, and chronic conjunctivitis. In addition to these, the committee found that exposure was also causally related to:

- respiratory cancers, including cancer of the nasopharyngeal tracts and lung;
- skin cancer, as well as pigmentation abnormalities of the skin, chronic skin ulceration, and scar formation;
- acute nonlymphocytic leukemia resulting from exposure to nitrogen mustard exposure, and probably sulfur mustard exposure as well;
- bone marrow depression and a decrease in the competency of the immune system (An acute reaction that can render a person more susceptible to infectious diseases with serious long-term consequences, such as rheumatic fever that can cause lifelong cardiovascular problems.);
- psychological disorders from gas chamber and field tests due to the combination of repeated threatening circumstances and toxic exposures (The committee was only able to identify general classes of psychiatric diagnostic categories because there is little known about the long-term expressions of untreated post-traumatic

stress disorder. However, the committee believes that the causal relationship between the experimental situations and development of psychological disorders in some subjects is clear.); and

- dysfunctions in sexual performance as a result of severe burns and scarring of sexual organs.

All other health conditions fell into one of two remaining categories. The second category is quite small and contains those conditions for which there are suggestive data, but not enough to establish a causal relationship. It includes leukemia from exposure to sulfur mustard and reproductive toxicity, including increased miscarriages or infertility.

The last category contains the majority of health problems reported by veterans during the public hearing process. This category covers those health problems for which few data exist to argue for or against a causal relationship. These include all cardiovascular problems (except those resulting from acute infectious diseases as mentioned previously), and neurological, hematological, and gastrointestinal diseases. The category further includes any reproductive effects that might result from exposure to lewisite. As you can see, the gaps in the literature still outweigh the certainties.

To close as many gaps as possible, the committee made a number of recommendations to the VA, but also to the Department of Defense. The committee asked the VA to identify the subjects from the gas chamber and field tests, to evaluate their health status, treat any causally related health problems found, and to initiate morbidity and mortality studies. I would like to emphasize here that the VA anticipated this recommendation and, under the direction of Dr. Susan Mather, initiated an investigation of the feasibility of identifying the subjects. This investigation began in the winter of 1992 and reports of progress were shared with our committee in June and August 1992.

The committee made a further recommendation to the VA to pay careful attention to the special problems of these veterans, stemming from years of official denials, the burden of secrecy, and the decades of silent worry about their health problems and their possible cause. Many of the affected veterans understandably feel betrayed and, over time, have come to believe that all their health problems are related to their exposure. Certainly, on the basis of the scientific literature, no one can be sure whether they are right or wrong. The VA system operates, however, on the basis of scientific proof and this is, and will continue to be, a difficult concept to translate to the affected veterans. It is especially difficult to do with people who have been secretly living with serious health concerns for five decades, or, in some cases, have been telling the truth only to be told that no such thing ever happened.

We also recommended that the Department of Defense attempt to identify former military and civilian workers exposed during gas handling and production, and to find those exposed following the Bari disaster. The records of military personnel should be turned over to the VA for notification and medical evaluation and civilians should be notified by the Department of Defense and advised about their options for appropriate compensation. Finally, the committee recommended that the VA and the Department of Defense widely advertise that any oaths of secrecy taken in World War II related to testing of mustard agents or lewisite are no longer binding.

In the preface to their report, the committee asked that each veteran who served as a human subject in the testing programs be honored for his sacrifice and that any continuing military research with human subjects be held to the same standards and guidelines applicable to civilian research; specifically, we recommend the inclusion of civilians on all research protocol review panels.

There are a variety of viewpoints regarding the ethics of these experiments. Many would argue that it was wartime and that, because they pre-dated the Nuremberg Code, no formal code of ethics had yet been formalized about human experimentation. It is, therefore, difficult to say clearly what the "standards of the day" were in the early 1940s. As a medical student, I volunteered as a human subject for medical research in the late 1940s. I knew what the experiment entailed and I had the right to withdraw from the experiment at any time. Professor Jay Katz from Yale University, a bioethicist who served on the panel that reviewed the Tuskegee experiments and whom our committee consulted, took the position in a letter to me (and reprinted in one of the appendices to our report) that the World War II mustard gas experiments did violate ethical standards and the Government should be held accountable. It is also true that the "standards of the day" were held up at Nuremberg by the U.S. Military Tribunal as the measure against which Nazi medical atrocities should be judged.

Members of our committee individually expressed differing opinions on the ethical issues presented by these experiments. Nevertheless, the consensus was that the combination of misleading the subjects, exposing them to high levels of toxic substances, demanding them to remain in the experiments and keep it secret for decades, and then neglecting to follow the subjects' health status required, at the very least, comment. We also believed that these abuses justified our recommendations to the government agencies involved to do everything possible to aid these men now and to ensure that adequate protections, equal to those in the civilian research arena, were in place for the present and future human subjects of military experiments.

Thank you.

Mr. BRYANT. Thank you, Dr. Rall. Dr. Finch.

STATEMENT OF DR. STEWART C. FINCH, VICE PRESIDENT, RESEARCH AND DEVELOPMENT, COOPER HOSPITAL/UNIVERSITY MEDICAL CENTER

Dr. FINCH. Mr. Chairman, I am probably here because of my background which involved 23 years as head of hematology oncology at Yale Medical School. I spent about 8½ years as, either as chief of medicine or chief of research at the Atomic Bomb Casualty Commission in Japan, and currently I am working with two committees, one for resettlement of the Marshall Islands, and the other for a leukemia study of the Chernobyl followup in the Ukraine.

I would like to address two issues: First, I would like to talk a little bit about the ethical standards in the early years and, second, my familiarity with some of the radiation studies.

Medical research prior to World War II was very poorly defined in terms of ethical standards. The usual objective was some form of new therapy directed at self, family member, or desperately ill patient. The situation changed dramatically with World War II. The Federal Government's Committee on Medical Research authorized many research studies on large populations.

And as David Rothman published in the New England Journal of Medicine in 1987, most of the studies were considered part of the war effort with an opportunity for disabled, retarded, and other institutionalized individuals to participate. The general feeling was that everyone should play a role in the achievement of victory and to that end it was considered very reasonable for incapacitated persons to participate in medical studies which might save lives of soldiers who were also risking their lives without having had the option of a voluntary informed consent. The agreement of subjects and their guardians for entering a research study was generally expected, but rarely were there extensive ethical considerations.

During the war years, many investigators responded enthusiastically to the outpouring of millions of Government dollars for studies on a massive scale. There was little concern about giving malaria to over 500 prison volunteers and many institutionalized psychotic patients in Illinois for the purpose of testing drugs for the treatment of malaria.

Influenza was administered to correctional institution children in order to test a flu vaccine. Prisoners, orphanage, and retarded persons in Illinois, Ohio, and New Jersey were infected with a strain of heat-killed bacteria in order to evaluate the effectiveness of immunization. Volunteers were even infected with gonorrhea in one study, but in that instance they did sign an informed consent.

The wartime practices carried over through the 1950's with the prospects of winning the war against degenerative and contagious diseases. The National Institutes of Health continued to support large clinical studies similar to those conducted during the wartime. Ethics changed very little as they were not challenged. The Nuremberg Code had been written in 1947 but was not well publicized, and few American investigators found little relevance of it to their types of research.

Early in 1960, however, things began to change. Some medical school clinical research centers at the direction of NIH created institutional committees to review research projects. A few medical schools organized broader review boards, but it was not until Henry Breecher published an article in the New England Journal of Medicine in 1966, however, that the medical research community really began to seriously consider the ethical aspects of human medical research.

Virtually all of the 21 studies which he reported in his article were considered somewhat unethical, and all were performed on institutionalized subjects between 1950 and 1960 at major medical schools and supported by leading Government agencies. Progress for the protection of human subjects and research progressed rapidly in the early 1970's, and I will not detail them as Dr. Henderson has very eloquently described them.

As he pointed out, the most recent Federal regulations which were revised in 1991, apply to all human research conducted, supported, or controlled by any Federal department or agency either within or outside the United States. Since the early 1970's, physicians and their institutions involved in human research, irrespective of the source of support, generally have closely adhered to the Code of Federal Regulations for the Department of Health and Human Services.

Human studies involving the use of ionizing radiation proliferated in the 1940's and through the 1970's, but they generally were of two types. The first and most frequently involved the use of radioactive isotopes for the purpose of studying the normal or abnormal metabolism of some elemental or biological substance in the body. The radioactivity provided a tag or label to identify the location or rate of turnover of the substance under study. Most of the amounts of radiation were small with short physical half-lives.

Examples of such studies were those employing radioactive iron, potassium, chromium, and iodine. A few similar studies, however, were conducted in patients with advanced illnesses with isotopes of longer half-lives such as those described, with radium and plutonium. Many of these studies have added immensely to our medical knowledge, and, to the best of my knowledge, none of these studies, at least those with the short acting isotopes, has resulted in any adverse long-term effects.

The second types of studies were those designated to evaluate the short- or long-term effects of localized exposure to certain types of ionizing radiation. The only study of this type with which I am familiar was that performed in the 1960's involving the irradiation of the testicles of a group of inmates at Washington State prison for the purposes of determining the smallest dose which would produce sterility.

It was my understanding that all inmates were scheduled for vasectomy but some were reported to have eluded the procedure. One eventual consequence of this study was said to be the universal policy of lead apron shielding of persons undergoing xrays while in a dental chair.

I think it is important that the types of human radiation studies in the 1940's, 1950's and 1960's be carefully considered as to whether the radioactivity was used to trace a substance in the body or study effects of radiation exposure.

Also, the amounts of radiation exposure in terms of either the early or late risk of adverse effects should be taken into consideration.

And furthermore, it is important to judge the propriety of these studies in accord with the accepted ethical principles and research philosophy for the war years and thereafter into the seventies.

I am unaware of any prospective U.S. military studies designed to evaluate the effects of ionizing radiation in military personnel. There have been, of course, many followup studies, particularly those veterans involved in defense testing.

Of 250,000 nuclear test participants of about 580 nuclear devices, the only test which showed any radiation effect was that of the Smokey test in Nevada 1957, and in that study of about 3,000 men there was a significant excess of leukemia during the followup period of about 20 years. The results of this study, however, are to be interpreted with caution as the size of the population and the number of leukemia cases was small.

I would say categorically that there is no evidence that the U.S. military troops that entered Hiroshima and Nagasaki received any significant amounts of radiation. The detonations were aerial exposure. The amount of ground radiation was very small and most of it disappeared within a few days. U.S. troops didn't arrive there for a period of many weeks or months.

That concludes my summary, and I thank you very much for the opportunity to have made these remarks.

[The prepared statement of Dr. Finch follows:]

Summary
Government-Sponsored Human Research

by Stuart C. Finch, M.D.

During World War II the Federal Government sponsored many large population research studies. Most were considered part of the war effort with an opportunity for disabled, retarded or other institutionalized persons to participate. Agreement of the experimental subjects from the subjects and physicians or guardians usually was obtained, but rarely were there any detailed ethical considerations or discussions regarding cost/benefit or alternatives such as we consider routine today. Malaria, heat killed bacteria, influenza virus and even gonorrhea was given to prisoners or other institutionalized persons.

The wartime practice continued through the 1950's and into the 1960's, mostly supported by Federal funds. Awareness of possible unethical research really commenced in the mid 1960's, but there was no significant change until the 1970's. The first set of government regulations regarding the protection of human subjects in research was published in 1973. Since that time virtually all medical investigators and institutions have followed the guidelines regarding the ethics of human research which have been established by the Department of Health and Human Services.

Radiation research during the 1940's through the 60's generally was of two types. The first involved using small amounts of radioactivity as a tag or label to identify the location or rate of turnover of a substance in the body. To the best of my knowledge none of these studies has resulted in any adverse long-term effects. The second type were those designated to evaluate the short or long-term effects of localized exposure to certain types of radiation. Medical knowledge was gained through both types of studies, which were conducted in accord with the practices of the time. I doubt that any of those early studies on confined or impaired persons would be acceptable by current standards.

Finally, I do not believe that any U.S. military studies were specifically designed to evaluate the effects of ionizing radiation in military personnel. The amounts of residual ground radiation in Hiroshima and Nagasaki were insufficient to result in leukemia or other cancers by the time that U.S. military personnel arrived in either area. Only one of the almost 600 weapons tests (operation Smoky) to date appears to have resulted in a significant increase in leukemia. The number of observations were small so that caution has been recommended in interpretation of the results.

Government-Sponsored Human Research

by Stuart C. Finch, M.D.

Medical research prior to World War II was very poorly defined in terms of ethical standards (Rothman,DJ, Ethics and human experimentation; Henry Beecher Revisited, NEJM, 317, 1195-1199, 1987). The usual objective was some form of new therapy directed at self, family member or desperately ill patient. Jenner first gave smallpox vaccine to a member of his own family. Pasteur first gave rabies vaccine to a child with rabies and Banting first gave insulin to a person in advanced diabetic coma.

The situation changed dramatically with World War II. The Federal Government's Committee on Medical Research (CMR) authorized many research studies on large populations. Most of the studies were considered part of the war effort with an opportunity for disabled, retarded or other institutionalized individuals to participate. The general feeling was that everyone should play a role in the achievement of victory, and to that end it was considered very reasonable for incapacitated persons to participate in medical studies which might save the lives of soldiers who also were risking their lives without having had the option of voluntary consent. Agreement of subjects or their guardians for entering a research study was generally expected, but rarely were there any ethical considerations, detailed discussions concerning procedures, risks, benefits, costs or alternatives such as we consider routine today. In other words, the standards were much different and the ethics were completely utilitarian.

During the war years many investigators responded enthusiastically to the outpouring of millions of government dollars for studies on a massive scale. There was little concern about giving malaria to over 500 prison volunteers and many institutionalized psychotic patients in Illinois for the purpose of testing antimalarial drugs. Influenza virus was administered to retarded and correctional institution children in order to test a flu vaccine. Prisoners, orphanage and retarded persons in Illinois, Ohio and New Jersey were infected with a virulent strain of heat killed bacteria in order to evaluate the effectiveness of immunization. Volunteer prisoners were even infected with gonorrhea in a treatment study, but in that instance, only after having received a two page description of the study as the outcome of some previous discussions regarding both the ethical and legal implications of the research plan.

The wartime practices carried over through the 1950's with prospects of winning the war against degenerative and contagious disease (Rothman,DJ; NEJM, 317, 1195 -1199, 1987). The National Institutes of Health continued to support large clinical studies similar to those conducted during wartime. Ethics changed very little as they were not challenged. Some well publicized studies during this period included the Willowbrook State School study of infectious hepatitis, the Jewish Chronic Disease Hospital study regarding the rejection of injected liver cancer cells and the San Antonio contraceptive study involving impoverished Mexican-American women. The Nuremberg code had been written in 1947, but it was not well publicized and few American investigators found little relevance of it to their types of research.

Early in the 1960's, however, things began to change. The Natanson vs Kline legal decision in 1960 regarding the charge of negligence for a physician who did not properly inform a patient in a research study of the nature of a study and its risks, and the thalidomide tragedy in Germany in 1961 were factors in raising some attention to ethical standards for NIH and other organizations involved in medical research. Some medical school clinical research centers created institutional committees to review research projects. A few medical schools organized broader review boards. In 1964 the Declaration of Helsinki was written by the World Medical Association. It was the first real formal document that defined standards for physicians involved in medical research. It was not until the Beecher article was published in the New England Journal of Medicine in 1966, however, that the medical research community really began to seriously consider the ethics of human medical research (Beecher, H.K.; Ethics and Clinical Research, NEJM, 274, 1354-1360, 1966). In that report Beecher indicated that of 100 consecutive human studies published in ethical journals which he had reviewed he found that 12 were blatantly unethical and only 4 even mentioned informed consent. Virtually all of the 21 studies which he reported in the article were performed on institutionalized subjects between 1950 and 1965 at major medical schools and supported by leading government agencies. Change in the late 1960's also was fueled by the revolt against authority, the development of protection groups and the interest of lawyers.

Progress for the protection of human subjects in research progressed rapidly in the early 1970's. The Canterbury vs Spence decision in 1972 concluded that law standards rather than those established by physicians should be the criteria of informed consent. The first set of proposed regulations on the protection of human research subjects was published in 1973 by OHEW, and the following year the final regulations were released in the form of 45 Code of Federal Regulations 46. These and other government publications called for the formal development of Institutional Review Boards at research institutions which would ensure proper informed consent for every person involved in a research study, careful evaluation of the risk/benefit ratio of human research, restrictions on the use of persons in confined circumstances, and follow-up of progress in research. In 1974 the National Research Act also was signed into law. It created the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The Commission summarized the basic ethical principles and guidelines for the resolution of ethical problems that surround the conduct of human research in the Belmont Report of 1979. The principles of this Report have provided the basis for a constantly evolving government policy on human research. The most recent Federal Regulations, are entitled Protection of Human Subjects (Title 45, Code of Federal Regulations, Part 46, revised June 18, 1991). These regulations apply to all human research conducted, supported or controlled by any Federal Department or Agency either within or outside of the United States. Since the early 70's physicians and their institutions involved in human research generally have closely adhered to the Code of Federal Regulations for the Department of Health and Human Services.

Human studies involving the use of ionizing radiation proliferated in the 1940's through the 1970's. They generally were of two types. The first and most frequent involved the use of radioactive isotopes for the purpose of studying the normal or abnormal metabolism of some element or biological substance within the body. The radioactivity provided a tag or label to identify the location or rate of turnover of the substance under study. Most of the amounts of radiation were small with short physical half-lives and/or rapid biological elimination. Examples of such studies were those employing radioactive iron, iodine, potassium, and chromium. A few similar studies, however, were conducted in patients with advanced illnesses with radioactive substances with long half-lives (i.e. thorium, radium, plutonium). Many of these studies have added immensely to our knowledge of disease and its therapy, and the sites of internal localization and turnover of environmental radioactive elements. To the best of my knowledge none of these studies has resulted in any adverse long-term effects. The second type of studies were those designed to evaluate the short or long-term effects of localized exposure to certain types of ionizing radiation. The only study of this type with which I am familiar was that performed in the 1960's involving the irradiation of the testicles of a group of inmates in Washington State Prison for the purpose of determining the smallest dose which would produce sterility. It is my understanding that all of the inmates in this study were scheduled for vasectomy, but some subsequently are reported to have eluded the procedure. One eventual consequence of this study was said to be the universal policy of lead apron shielding of the gonads of persons receiving x-rays while in a dental chair.

It is important that the types of human radiation studies of the 1940's, 50's and 60's be carefully considered as to whether the radioactivity was used to trace a substance in the body or to study the effects of radiation exposure. Also, the type and amount of radiation exposure in terms of either early or late risk of adverse effect should be taken into consideration. Furthermore, it is important to judge the propriety of these studies in accord with the accepted ethical principles and research philosophy of the war years and thereafter up to the 1970's. In retrospect, few if any of the medical radiation studies or those involving the utilization of confined or impaired persons during the post war era would be acceptable by current standards.

I am unaware of any prospective U.S. military studies that were designed to evaluate the effects of ionizing radiation exposure in military personnel. There have been, however, numerous follow-up studies of military personnel who possibly were exposed to excessive amounts of radiation during weapons testing or from ground radiation in Hiroshima and Nagasaki. Overall there is no statistically significant evidence of either increased leukemia or cancer in about 250,000 nuclear test participants in tests of about 588 nuclear devices. The only exception was the Smoky test in Nevada in 1957. In that study of about 3,000 men a significant excess of leukemia was observed during a follow-up period of about 20 years. The results of this study are to be interpreted with caution, however, as the size of the study population and the number of leukemia cases are small. Residual ground radiation initially was small in even the most contaminated areas of Hiroshima and Nagasaki, since both detonations were well above ground. Measurable amounts of ground radiation in the most contaminated areas disappeared to insignificant levels within a few days. Studies of the Hiroshima and Nagasaki residents who entered or worked near the atomic bomb hypocenters have not demonstrated increased leukemia or cancer. In my opinion the involvement of U.S.

military forces which commenced in supervisory capacities in both cities, several weeks to several months following the detonations, strongly mitigates against any potential carcinogenic effect from ground radiation exposure in either city.

Mr. BRYANT. Thank you, Dr. Finch.

Let me ask you a question. Let's assume that someone was tested and told that no one knew what the outcome of the test might be or what the dangers were involved in it, but the person went ahead and participated as a subject in an experiment and then was gravely injured as a result of it.

Would it be your view that we would be responsible as a country to pay some type of compensation for that?

Dr. FINCH. I certainly would if they were not told and there was an adverse effect that could be directly related to that substance.

Mr. BRYANT. I am saying if we are going to ask you to participate in an experiment, we don't know what might come out of this, it might be very dangerous, would you be willing to do it, and then you were damaged by it.

Dr. FINCH. I think they should be compensated. It is standard practice when drawing up contracts with pharmaceutical companies when they are testing a new drug that the company will be made responsible for any adverse effect that is directly due to that drug even though you explain to them the possible adverse effects that might occur.

Mr. BRYANT. Well, having established that and I certainly agree with that, then to what extent is it necessary for us as a committee trying to do what is consistent with the conscience of this Nation to ask questions about whether or not there was informed consent?

Dr. FINCH. Well, I think that the ethics of the subject entering into the study is one aspect of it. And second, are the medical consequences. If they can be related to that compound, I think they should be compensated. The ethical aspects of it, I think, are a separate consideration.

Mr. BRYANT. Let me ask any or all of the panel members if you think that the American public would have supported the types of experiments that we have heard about that were conducted on vulnerable populations had the public been informed at the time that this was going on?

Dr. Herken, first, going left to right.

Dr. HERKEN. I think one problem there is a vulnerable population would include, for example, the mentally retarded, and how you would determine consent in that case I have no idea.

Mr. BRYANT. But it is not a question of consent; it is a question of, do you think the public would have supported doing experiments like that on that type of a vulnerable population?

Dr. HERKEN. I think the public's problem would be in a fact that these people were in a sense selected out because of their disability. If it was more of a random process or if it was a cross section of the whole community or society, there would have been support, perhaps.

Mr. BRYANT. Dr. Rundo.

Dr. RUNDO. Well, I was only going to comment that in the case of the plutonium injections, the experiments were classified and I don't know how you handled it under those circumstances. I mean, the information was desperately badly needed, the material itself. They couldn't mention the name plutonium. It was years before anybody would admit the existence of plutonium.

So I just don't see how you can handle it under those circumstances. You have to remember the circumstances at the time.

Mr. **BRYANT**. Still, it seems difficult to justify conducting extremely dangerous experiments on people that don't understand the degree of possible harm because we need it no matter how urgent the need.

Dr. **RUNDO**. At the time I don't think anybody could predict whether or not there would have been any effects. They could have said there might be effects but they couldn't have said categorically one way or the other there will be effects, or there will be no effects.

In point of fact, of the 18 cases, there isn't a single case where the person died of anything other than natural causes. The effects that one would expect from an injection of plutonium would be a cancer of the bone, osteosarcoma, or liver cancer. And there were no cases.

Although there were doses that were possibly high enough, radiation doses may have been high enough in two of the cases for a liver cancer to have developed, but did not.

Mr. **BRYANT**. What about other biological effects? It might have caused them to die or live a less than full life.

Dr. **RUNDO**. These are the only effects that we know are caused by radium which we have studied in great detail or thorium which has also been studied in some detail.

Mr. **BRYANT**. You say in your written testimony that you would never conduct experiments on humans without first getting their consent. Yet, my understanding is that participants in the followup study that you helped run in 1973 were still not told that they were involved in plutonium experiments. Did that violate your own standard for getting informed consent?

Dr. **RUNDO**. Well, that is a difficult question. I hadn't thought of myself as having conducted an experiment. We wanted to get the urine and feces, and we had a very large group of people and I was not the one that went to these people and said, please, would you go into the hospital for us.

Now, I know that is an evasive sort of answer, but it was our practice at the time in the study of late effects of radium, the people we studied, did sign informed consent forms. And so I would have thought that the plutonium subjects should have signed informed consent forms. The fact that they didn't was a political one because at the beginning we were first told—not I, but someone in the group—were told not to tell them that they had plutonium, but a year or so later or maybe not as much as a year later, somewhat later, this was rescinded and they were in fact told.

Mr. **BRYANT**. Dr. Herken, you indicate that in February 1945, Dr. Hamilton rejected a potential collaborator at the University of California Hospital on the grounds that the rejected researcher had, "more than average ability," and can figure out, "that something very peculiar was going on."

That would seem to indicate that these experiments violated the ethical standards of the time or some standard if this fellow was fearful.

Dr. **HERKEN**. I think it is proof that there was a concern on the part of Hamilton and Stone of the reaction if this got out. This is also confirmed in a letter that has gotten some press recently, a letter of November 1950 where Hamilton refers—I believe he is writing to Shields Warren, and he expresses concern about this may be seen as a touch of Buchenwald. He is actually proposing some new inhalation experiments with radioactive iodine. That has been used to indicate that Hamilton is a wide dissenter to the experiments. If you read the memo, Hamilton is identifying what he considers to a public relations problem, not an ethical problem.

Mr. BRYANT. You say in the Elmer Allen plutonium experiments two doctors certified that he was mentally competent and willing to accept the treatment. Did that form of consent conform to the ethical standards of 1947?

Dr. HERKEN. I am not sure. I am not an ethicist but an historian, but I do know that there was a concern on the part of the AEC with signed consent by that time that, as of a meeting of April 1947, actually as early as March 1947, the legal department of the AEC was urging there be signed consent.

There was a meeting early April between the AEC and the University of California, and at that meeting the doctors at the University of California argued against signed consent. In a memo of April 30 from the AEC, back to the university, the AEC conceded on that point and agreed there need not be signed consent by the subject so long as there was a written certification by two attending physicians attending the injection that the patient understood the procedure and agreed to it.

Mr. BRYANT. Dr. Rall, you said that 2,500 men were subjects in gas chamber tests and at least 1,500 participated in field tests. How many of them would you estimate suffered ill health effects from the testing?

Dr. RALL. We really have no way of knowing. I point out those are our minimum figures because from most of the test sites and the chambers we could get absolutely no information at all. An official history says that 60,000 servicemen were involved in the testing programs. I would say some of them got severe late effects, but I think there is no way of estimating what fraction or what percentage.

Mr. BRYANT. How many of these people would you expect are still alive?

Dr. RALL. About 50 to 60 percent.

Mr. BRYANT. Are you familiar with the proposed regulations concerning mustard gas subjects issued by the VA last week?

Dr. RALL. Yes. Those were a followup of our report, as I understand it.

Mr. BRYANT. Do you think that VA ought to provide compensation for all the test participants who ought to get compensation?

Dr. RALL. As far as I can understand, they are providing compensation for all of those who suffered conditions that we would describe as causally related to mustard gas.

Mr. BRYANT. Mr. Gekas.

Mr. GEKAS. I thank the Chair.

I drew from a question that the Chairman asked of Dr. Finch and from Dr. Finch's answer that we are all forming an opinion that those who gave totally informed consent, let's say a pluperfect consent, but were nevertheless hurt, injured as a result of the experimentation or testing, should still in our purview be eligible for compensation.

That denotes, I would think, that the only difference that we can see between those who had informed consent and those who were subjects of subterfuge or misled decisions would be subject also to be eligible for compensation, but also perhaps a separate category we ought to be setting up in the nature of punitive damages to appeal to their better senses to ask forgiveness as a country and to add a different level of compensation for them.

Otherwise, it becomes just a question of rounding up all those who were victims of experimentation, informed consent or no, and just acting as an insurer and hand out the benefits that way.

Should we have a bifurcated level of awards?

Dr. FINCH. Well, I would like to address that if I could. First of all, I think there should be judgment of judging the ethical standards. Again, I think one has to take into consideration the ethical standards of the times in terms of how informed people were and how informed they should have been. That is one aspect of it.

As far as compensation is concerned, I think one has to think very seriously about the amount of substance they received and did it produce a known effect from that substance. It is not thought, for example, that radiation exposure is likely to produce heart disease 30 years later. To my knowledge, unless there is direct radiation of the heart, this does not occur. The only study that I am aware of that even remotely alludes to this is the current study in Japan where highly exposed women in Hiroshima appear to have somewhat of an increased mortality or have more cardiac involvement but only in Hiroshima, but not in Nagasaki, and not in men.

So I think that compensation should be related to known effects of the substance they received in relationship to the amount they received.

Mr. GEKAS. Yes, which in turn means we may have four or five different levels of compensation if we want to do a complete formula for that: Those who had informed consent and were not harmed at all; those with informed consent who were slightly injured; those who were debilitated, made disabled altogether; others who might have died. And then we go on and on, and it is a mammoth problem.

One question that I have to follow up on, in any of the experiments to which you have testified—I ask the panel in general—in hindsight, could any of the results that aided research and aided the general knowledge of the science community, could that have been accomplished with nonhuman experimentation, animal research, biomedical research of other types, or did we shortcut everything or did they in that time shortcut everything by going right to the human for testing?

Yes, Dr. Rundo.

Dr. RUNDO. As far as the plutonium injections were concerned, experiments had of course been done with animals and it was the results of those experiments that showed that there was such a tremendous variation from one species to the next that it was impossible to extrapolate to man and the only way to get the information needed was to inject people.

In retrospect, if we had then the technology that we have today, it could have been done at much lower levels of radiation with shorter-lived isotopes of plutonium. But that was 1947 and this is 1994.

Dr. RALL. Yes. With salt or mustard, these had to be done on people. I think one can question whether they needed to use as many subjects as they used again in retrospect.

Mr. GEKAS. I thank you. We are on the doorstep of a door that might open a real haunted house for us, but we have to proceed. I thank the Chairman.

Mr. BRYANT. Well, I would like to thank each of you on behalf of the committee for taking the time to travel here and to be here this afternoon and to wait so long to testify.

As the ranking member just stated, we are not sure what we are going to discover here in the next few months, and we appreciate your helping us deal with this matter. Thank you very much.

With that, the committee stands adjourned.

[Whereupon, at 6:10 p.m., the subcommittee adjourned.]

APPENDIX

MATERIAL SUBMITTED FOR THE HEARING

THE SECRETARY OF VETERANS AFFAIRS
WASHINGTON

FEB 1 0 1994

The Honorable William J. Perry
Secretary of Defense
The Pentagon
Washington, DC 20301-1155

Dear Mr. Secretary:

Recent disclosures concerning inappropriate radiation-related human experimentation in the late 1940's and 1950's caught us all by surprise and caused the Administration to react immediately. The Department of Veterans Affairs is now carefully searching our own records to determine whether experimental abuses occurred under our aegis and I have expressed my personal distress at recently learning that VA at one time apparently had a secret Atomic Medicine Division.

In the past, VA also has been surprised by allegations and disclosures of various types of chemical testing or exposure conducted by the military, for example, mustard gas testing and LSD experiments.

VA's responses to these situations were as quick and comprehensive as circumstances and current knowledge permitted. However, concern exists that additional, previously undisclosed, questionable programs may have been conducted. Thus, I believe that our departments need to work together to avoid similar future surprises and to help ensure that veterans are not needlessly disadvantaged by military service. In my view, we should adopt the goal of identifying all veterans who may have been harmed by their participation in improper experimentation while serving on active duty and assist them in applying for any benefits for which they may be entitled. To this end, I propose the formation of an interdepartmental working group to design and undertake a review of projects, other than appropriately approved medical research, involving the exposure of military personnel to toxic substances or environmental hazards. In order to provide for the development of this proposal, I have designated Deputy Undersecretary for Benefits R.J. Vogel as the VA contact in this matter, and I request that you name an appropriate DoD official to contact Mr. Vogel in order to initiate discussions.

I know you share my concern for the welfare of our veterans and I would appreciate your immediate attention to this request. I look forward to your response.

Sincerely yours,

Jesse Brown

THE SECRETARY OF VETERANS AFFAIRS
WASHINGTON

January 5, 1993

The Honorable Dick Cheney
Secretary of Defense
The Pentagon
Arlington, Virginia 20301-1155

Dear Mr. Secretary:

I am writing in regard to the report entitled "Veterans at Risk: The Health Effects of Mustard Gas and Lewisite" to be released on January 6, 1993. I received an advance briefing on this National Academy of Sciences (NAS)-Institute of Medicine report on December 16, 1992, at which time I urged the Academy to brief your Department on the study since many of the recommendations involve the Department of Defense (DoD). I am pleased the Academy briefed Assistant Secretary of Defense for Health Affairs Enrique Mendez, Jr., M.D., his immediate staff, and certain VA staff on its findings and recommendations on December 29. At that time the NAS provided Dr. Mendez an embargoed copy of the full report, an executive summary of which is enclosed.

It is my understanding that at the meeting Assistant Secretary Mendez advised the Academy that DoD would need time to study the entire report and would do so with an eye toward making every effort to carry out the Academy's recommendations.

In the meantime, VA is planning to begin carrying out many of the recommendations directed to this Department. Concerning our responsibilities, I am seeking DoD's assistance in the following areas:

a. Personnel Tested. Regarding the recommendation on page 6 of the NAS report, VA requests the names, service numbers and military units, by test site, of military personnel in World War II testing programs (chamber and field tests and, to the degree possible, patch tests). Please identify the type of test for each person listed and the agent used, including whether it was nitrogen mustard or sulfur mustard. VA will then make every effort to obtain through various official channels the subjects' current addresses and notify them of the possible health risks associated with their exposures, evaluate them medically, and, as appropriate, include them in morbidity and mortality studies.

Further, beyond the NAS report, we request the names, service numbers, type of tests and whether nitrogen mustard or sulfur mustard for 147 service members who were exposed to mustard agents at Edgewood Arsenal between 1955 and 1965. (Please see attached excerpt from "Possible Long-Term Effects of Short-Term Exposure to Chemical Agents," published by the National Academy of Sciences Press, Washington, D.C., 1985.)

b. Other Type Exposures. Regarding the recommendation on page 7 of the NAS report, VA requests the names, serial numbers, and duty stations of former active duty military chemical warfare production workers exposed to mustard agents or Lewisite through gas handling or training or through the Bari, Italy, harbor disaster or other circumstances. Please describe the circumstances of exposure and the specific agent, including whether nitrogen mustard or sulfur mustard, for each person identified.

c. Relief from Oath of Secrecy. Page 8 of the NAS report recommends that VA and DoD publicly announce that personnel exposed to mustard agents or Lewisite during their service are released from any oath of secrecy taken at that time. We request that DoD release the personnel involved in this testing from their oath of secrecy. VA will work together with DoD to communicate this release to our veterans.

VA looks forward to working with DoD on this very important matter.

With kind personal regards, I remain,

Sincerely,

Anthony J. Principi
Acting Secretary

Enclosures

cc: Assistant Secretary of Defense for Health Affairs

BEST AVAILABLE COPY

TESTIMONY OF THE HON. MARTIN FROST
BEFORE THE SUBCOMMITTEE ON ADMINISTRATIVE LAW AND GOVERNMENTAL RELATIONS

FEBRUARY 2, 1994

****

Mr. Chairman, I appreciate having this opportunity to testify today on the recent disclosures that the United States Government conducted secret radiation experiments on its citizens beginning in the 1940s.

Over the last couple of months, we've been hearing about some of these experiments. We learned, for example, that mentally retarded children were fed food containing radioactive material. We learned that pregnant women were given radioactive medication. We've learned about radiation experiments conducted on veterans in VA hospitals. And we've learned about eighteen individuals being injected with plutonium.

One of the people injected with plutonium, Elmer Allen, lived in my Congressional District in Texas. Believing he was being treated for bone cancer, Mr. Allen received an injection of plutonium in 1947. Although doctors did not expect him to live long, Elmer Allen lived another 44 years. But those were difficult years for a man troubled by numerous illnesses and health problems. Neither he nor his family ever knew for certain that he had become a guinea pig for government scientists, though he often told others he had been the subject of some kind of experiment.

His story was recently told in an Alburquerque Tribune story by reporter Eileen Welsome. I'd like to submit a copy of this story and make it a part of the Subcommittee's record.

I have been working with the Allen family to obtain the release of all the relevant records and documents pertaining to Elmer Allen's case. Secretary of Energy Hazel O'Leary has personally committed to me that she will do everything she can to get this information to the Allen family so that they can learn the truth.

While we are still learning about the experiments, we do know this much: many of the radiation experiments were conducted without the person being tested ever knowing what was happening. Rather than informing these people about the nature of the experiments and the likely risks, the government and its scientists simply found opportune moments to conduct the experiments secretly.

What the Federal Government did to these people was outrageous. Experiments like these happened in Nazi Germany and the Soviet Union, not here. Unfortunately, we are now learning that they did happen here.

Now, we have to decide what we are going to do for those victims who are still living, or for the families of those test subjects who are deceased.

I applaud both President Clinton and Secretary of Energy O'Leary for the steps they have taken to learn more about the nature and extent of the testing that took place. They have pledged to locate the relevant records and documents, and inform the families of the results.

The question of compensation has also been discussed. Both President Clinton and Secretary O'Leary have stated that they support the idea of compensation.

I have introduced a bill, the Radiation Experimentation Compensation Act, that will provide compensation to the individuals who were experimented on and their families. My bill would authorize a payment of $50,000 to each person who, without giving their informed consent, was the subject of an intentional radiation experiment. A process would be set up by the Attorney General to review claims and determine which ones are eligible for compensation.

As you are aware, Mr. Chairman, there is a precedent for compensating victims of radiation testing. In 1990, Congress approved the Radiation Exposure Compensation Act to provide payments for those who had lived downwind of nuclear weapons tests, as well as for uranium miners. My bill looked to the Radiation Exposure Compensation Act as a model, and borrowed many of its provisions.

There is one significant difference between that Act, and the bill I'm proposing. The earlier Act links compensation to the subsequent development of certain types of cancer. My bill presumes that people secretly tested on have been harmed by the very act of the experiment. Therefore, compensation is linked to a showing that the claimant was in fact the subject of a secret radiation test.

Admittedly, we may still be learning about how well the earlier act has worked in practice and, given the similarities between that legislation and mine, I'm interested in the assessments of this Subcommittee on that issue.

We can never fully compensate these people for what their government has done to them. However, we can provide some measure of relief with this payment and recognition that the United States Government was wrong to conduct secret experiments on its citizens.

Again, Mr. Chairman, I appreciate having this opportunity to testify.

TRIBUNE
NOVEMBER 15, 1993

The Plutonium Experiment

PART I

Railroad porter Elmer Allen injured his leg in a fall from a train, triggering a chain of events that swept him into a top-secret experiment. Scientists used him as a guinea pig in a medical project that still is under wraps.

BY EILEEN WELSOME / TRIBUNE STAFF WRITER

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THE PLUTONIUM EXPERIMENT

Some compare it to Nazi war atrocities. Others say it had to be done to understand the dangers of a powerful new element that launched the Atomic Age.

Eighteen ordinary people were injected with plutonium without their informed consent, and their names have been kept hidden. Until now. In this three-part series, The Tribune tells some of their stories.

TODAY: *Elmer Allen goes to the hospital with a knee injury. He's injected with plutonium, his leg is amputated, and he spends the next 44 years struggling to survive.*

TUESDAY: *Albert Stevens moves his family to California to start a new life, but he's misdiagnosed with terminal stomach cancer and tagged for the secret experiment. Body parts removed during surgery turn up in a lab, where they're analyzed for plutonium.*

WEDNESDAY: *Eda Schultz Charlton doesn't learn that she's been injected until decades later. Her fear of cancer turns into an obsession.*

Courtesy of Fredna Allen

ELMER ALLEN – "CAL-3"

They met in a bustling El Paso railroad station while war raged on nearly every continent
Elmer Allen and Fredna Hadley fell in love, married and moved to the Bay area to start a new life.
But the new beginning turned into a nightmare in a San Francisco hospital.

ELMER ALLEN LOSES HIS LEG – AND ALL HOPE

Elmer and Fredna's relationship began in the turmoil of World War II, and the fallout from that war was to cloud their lives forever.

At 3.30 p.m. on July 18, 1947, doctors in a San Francisco hospital gathered around a patient's bed and explained an experiment they were about to perform. The patient, a railroad porter with an eighth-grade education, nodded his assent. Doctors later would describe him as "fully oriented and in sane mind."

A bull's-eye was drawn in ink on the hard, smooth calf of the man's left leg. A hypodermic needle loaded with plutonium, a silvery, man-made metal considered one of the most toxic substances on Earth, was plunged into the center. The needle sank nearly an inch. There was no bleeding when it was withdrawn and no pain or discomfort "whatsoever" 6 1/2 hours later.

Three days later the left leg was amputated at midthigh for what was believed to be a pre-existing bone cancer. Tissue samples were sent to a laboratory where researchers conducting a secret experiment were eager to find out how, among other things, plutonium distributed itself in the human body.

The patient was Elmer Allen. He was the 18th and last person to be injected with plutonium in an experiment conducted between 1945 and 1947.

Elmer, who was 36 at the time, returned with his wife to her small hometown of Italy, Texas, where a bleak future awaited him. He would suffer epileptic seizures, alcoholism and eventually be diagnosed as paranoid schizophrenic — a mental illness his family doctor said centered partly on his feelings about how he had been used.

• • •

It was the summer of 1944 when Fredna Hadley met a strapping young porter named Elmer Allen in a West Texas train station. It was a romantic beginning in an era of romance — a time of sad farewells and sweet homecomings in a democracy caught up in a global war.

Fredna, a young graduate of Tillotson College in Austin, Texas, was in the El Paso train station waiting for the train that would take her to Los Angeles to see her aunt.

"People were pushing to get on the train. This woman had some children, a little baby in her arms and two small children. I stepped back and let her go in front of me, and they closed the gates," Fredna recalled.

She began to cry. Elmer, a porter for the Pullman Co., noticed her distress.

Nearly 30 years after Elmer had grown accustomed to the phantom aches and pains of the amputated leg, he was brought to the University of Rochester's Strong Memorial Hospital. Elmer was not told the truth about the studies, which involved the collection of his urine, stool and blood samples. Fredna says the doctor in the picture is Christine Waterhouse, who cared for two other plutonium patients for many years.

Courtesy of Fredna Allen

"If they told my father that he was injected with plutonium, that would be like telling him he was injected with ice cream. He would not know the difference."

Elmerine Whitfield
Elmer Allen's daughter

"I can get you on the next train," he said.

Their love affair began. Not long after that, Elmer followed Fredna to her hometown of Italy, Texas, a small farming community 45 miles south of Dallas.

After a brief courtship, Elmer and Fredna were married on Sept. 10, 1944. They moved to Oakland, Calif., and later to nearby Richmond. Their first child, Elmerine, was born a year later. A second child, William, was born two years after that.

Elmer continued his work as a railroad porter while Fredna worked as an aide in a health clinic. Like Texas, the postwar Bay area was still segregated, but the African-American couple felt happy to be working. "We were optimistic about the future," Fredna recalled.

But an accident occurred on Sept. 3, 1946, a minor accident really, which would set in motion events that would forever alter their lives. Elmer was trying to get off a train in Chicago when it jolted and threw him to the side, injuring his left knee.

When he got back to Oakland, a company doctor took an X-ray. The film revealed a fracture. Elmer was advised to wrap the knee in an Ace bandage and apply heat, but that didn't help. He was referred to another doctor.

A second X-ray showed a lesion in the knee area had grown. A biopsy was done. The pathologist found no evidence of abnormal growth or tumor. "The principal picture is that of newly forming bone, organizing hemorrhage and chronic inflammation," he said.

Elmer was unable to work and the Pullman Co. refused to accept liability for the accident, saying the injury didn't appear to be "on a traumatic basis." He couldn't afford further treatment and was referred in June 1947 — almost a year later — to the outpatient clinic at the University of California Hospital in San Francisco.

By then, Elmer's physical and financial situation was desperate. His knee had swollen to three or four times its original size and was so tender he couldn't put weight on it. He was taking pain medication and had been out of work for six months. According to a hospital application form, Elmer had $60 in debts and $25 in cash. (His rent alone was $35 a month.)

Elmer's diagnosis worsened, and he later was admitted to the San Francisco hospital. His medical records show the following:

- June 25, 1947. A doctor examining one set of X-rays suggests the changes in Elmer's knee could stem from an infection superimposed on a surgical defect, but he says the possibility of bone cancer "must be seriously considered."
- July 3, 1947. The doctor examining the June 25 X-rays does another set and reverses his opinion. Elmer, he said, "probably" has a cancer in the cartilage or bone. He doesn't rule out infection.
- July 14, 1947. The hospital's pathology department does a second biopsy. Elmer definitely has a form of bone cancer, a pathologist said.

The doctors decided the only way to prevent the spread of bone cancer through his body was to amputate his leg, a treatment still used today. Bone cancer is a rare disease that is usually fatal by the time it is diagnosed. Eighty percent to 95 percent of patients who have it die within five years of its discovery.

The days and weeks after Elmer's amputation are a blur to Fredna's mind. What she remembers most is how scared she was — two babies to support and a husband with an amputated leg.

"I was so far away from my people," she said.

They were both far from home and about to be hurtled into a more alien world — an experiment conducted by scientists of the Manhattan Project, which produced the atom bomb.

• • •

While scientists at Los Alamos National Laboratory were designing the bomb itself, other research was being done at the Metallurgical Laboratory at the University of Chicago, the William H. Crocker Radiation Laboratory at the University of California in Berkeley and other labs.

Much of the health and safety research centered on new, radioactive elements that were capable of sustaining a nuclear chain reaction. Of great interest was plutonium, named after the planet Pluto.

"It really should have been called 'plutium,'" Glenn Seaborg, a co-discoverer of plutonium and Nobel laureate, said from his Bay area home. "But we liked how 'plutonium' rolled off the tongue."

Plutonium was discovered in 1941 on the University of California campus in Berkeley. Plutonium 239 has a half-life o 24,365 years, the time it takes for half o its radioactive atoms to decay.

The military potential of plutonium, material so secret that it was referred t during the war years as "the product," wa recognized. Scores of young scientist recruited into the secret Manhattan Projec went to work, trying to figure out how t manufacture plutonium and other radioactive isotopes in large enough quantities t be harnessed into an atomic bomb.

By the fall of 1942, enough plutoniu had been made to be visible to the nake eye. As the amount of plutoniu increased, so did concern over its toxicit

In 1944 — a year before the huma experiments were to begin — I

HOW WE FOUND ELMER

A small town listed in a government record provided the clue we needed to find Elmer Allen.

A 1973 Department of Energy document received under the Freedom of Information Act mentions a letter written to the physician of "CAL-3" in Italy, Texas. If the physician was in Italy, Texas, maybe the patient lived there, too.

Perhaps someone in Italy, a small town south of Dallas, would know the identity of "CAL-3" if we were to describe what we knew about him, an African American man about 80 years old whose left leg had been amputated years ago.

We called Italy's City Hall in 1992. Elmer Allen was the man we were looking for, they told us, but he died a year ago. "Do you want his wife's number?" they asked.

We met with Elmer's wife, Fredna, and his daughter, Elmerine Whitfield, in July 1992. Everything matched – names, dates, places. Fredna even had an itinerary of the trip they took in 1973 for a follow-up study. The dates matched government documents.

Although Elmer told his family doctor and a good friend about the injection, the news shocked Fredna and Elmerine. It was particularly hard for Fredna, a soft-spoken woman of 77.

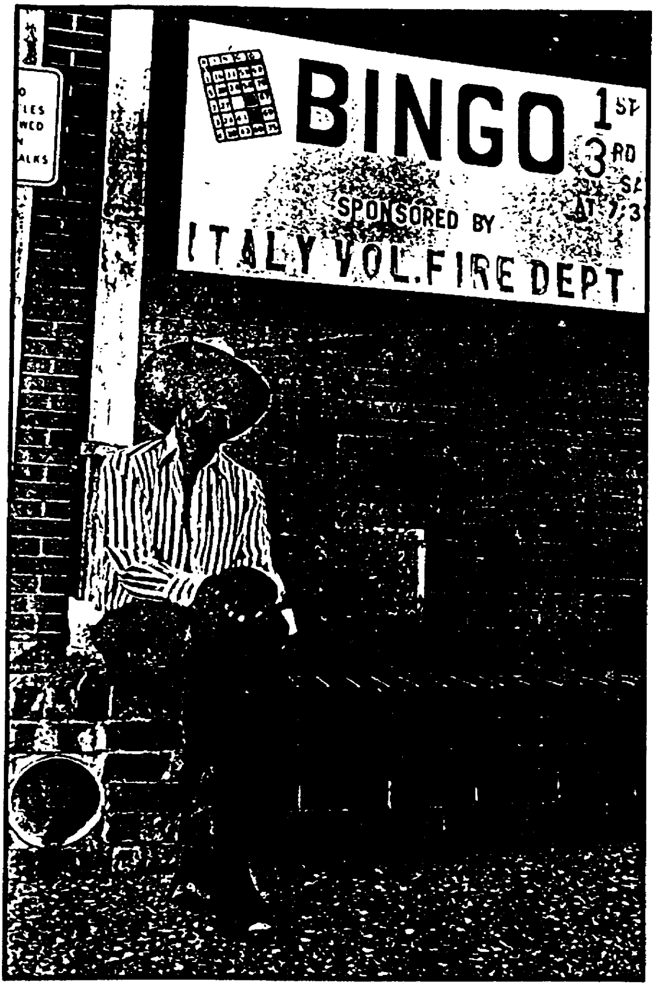
Elmer lived for 44 years after he was injected with plutonium. When we visited, the grass had not yet grown over his grave. A small metal plate, which will be replaced with a double tombstone, is etched with his birth and death dates: Jan. 20, 1911, to June 30, 1991.

"It doesn't make me angry," Fredna said. "It just gives me a better view of accepting what people say and how they will do you when they feel like you don't know any better."

But Elmerine feels a different way. "I'm angry. I'm very upset. But being African-American, I stay angry about a lot of things. I just wish this had come out before my dad passed away so we could do something more about it."

Fredna helped put together the story of her husband's life. She gave the family doctor permission to speak with us and authorized The Tribune to obtain Elmer's medical records from the University of California Hospital in San Francisco.

Those records included written documentation showing Elmer's purported consent for the injection and the proof he was the patient who, for nearly 50 years, was known only as "CAL-3."



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"He told me they put a germ cancer in his leg. They guinea-pigged him. They didn't care about him getting well. He told me he would never get well."

Joe Speed
Elmer Allen's friend

Eileen We

Fredna stands over the scarred ground and a small metal plate marking the grave of Elmer, the last surviving plutonium patient. He died in June 1991, 44 years after he was diagnosed as terminal and injected with plutonium. Fredna can't understand why doctors didn't include her in the discussions about injecting her husband with plutonium. "It seems like they should have told me about it," she says.

milligrams of plutonium (about the size of the head of a pin) were set aside for animal studies by physician and researcher Joseph Hamilton at UC-Berkeley. Col. Stafford Warren, the chief medical officer of the Manhattan Project who authorized the experiment, described plutonium in 1946 as the "most poisonous chemical known."

Plutonium had properties similar to the radioactive element radium. The human toll wreaked by radium was well-documented, and the federal government wanted to avoid a similar tragedy in its laboratories.

Young women who had worked in factories painting luminous figures on watch dials with radium-laced paint in the 1920s were developing cancer. It was discovered that many had swallowed lethal amounts of radium when licking their paint brushes.

Unlike radium, which decayed to radon and could be detected in the breath, the only way to measure plutonium in the body was through urine and stools. And the only way to extrapolate how much plutonium a person may have been exposed to, researchers figured, was through an experiment in which a known amount of plutonium would be introduced into the body and carefully measured in the urine and stools.

"Studies conducted on man involving the introduction of known quantities of the element into the human body were viewed as the only solution to the problem," states a report by the Atomic Energy Commission, which investigated the experiment in 1974.

The injections began in 1945, just three months before J. Robert Oppenheimer watched the atomic bomb near Alamogordo and recalled an ancient Hindu quotation: "I am become Death, the destroyer of worlds."

The first patient, injected on April 10, 1945, was an African-American suffering from severe auto injuries and hospitalized at the Manhattan Engineer District Hospital in Oak Ridge, Tenn. The patient walked out of the hospital several weeks later, giving rise to a long held belief by some researchers that the plutonium actually had promoted a rapid healing of the bones. "They gave him a whopping dose of plutonium," recalled Karl Morgan, the former director of Oak Ridge's health physics division. "They were surprised a Black man who had been scheduled to die had walked out of the hospital and disappeared."

> **"It really should have been called 'plutium.' But we liked how 'plutonium' rolled off the tongue."**
>
> Glenn Seaborg
> Co-discoverer of plutonium

Three patients were injected at Billings Hospital at the University of Chicago, three patients, including Elmer, were injected at the University of California Hospital in San Francisco, and the remaining 11 patients were injected at Strong Memorial Hospital, the teaching hospital of the University of Rochester in upstate New York.

Wright Langham, a group leader in radiobiology at Los Alamos, went to Rochester to help coordinate the experiment on the 11 Rochester patients. Langham, who was later known as "Mr. Plutonium," may have escorted the numerous samples shipped back to New Mexico by train. Los Alamos did the chemical analyses of the urine, stool, blood and tissue samples taken from patients.

Scientists were looking for patients suffering from chronic diseases that made survival for more than 10 years unlikely. Two reasons lay behind this thinking, one humane and one utilitarian.

First, they wanted to avoid the possibility of radiation effects, such as cancer, showing up later in life. Second, early death improved the chances of obtaining what a Los Alamos report called "post-mortem material" — body parts.

Livers, spleens, gonads, kidneys, hearts, ribs, intestines — virtually every organ — would be harvested and measured for plutonium in patients who died soon after the injections.

Three patients were African-Americans, and 15 were White. Five — including Elmer, Albert Stevens, John Mousso and Eda Schultz Charlton — lived for more than 20 years after the injections.

That alone is reason to condemn the project, some scientists say. "I find that when people play God, when they find somebody's terminal and therefore it's all right to do something to them you wouldn't do to other people, I find that rather obnoxious," said Berkeley scientist John Gofman, considered one of world's leading experts on low level ation.

Had they lived 50 years, the plutor patients would have received an ave of 44 times the radiation the average son receives in a lifetime from b ground and medical X-rays. But t patients received much more.

Elmer received the smallest dose, b received plutonium 238, a "hotter" that is more unstable and more radioa than plutonium 239. About half rema in the amputated leg, giving Elmer a six times the radiation the average pe today receives in a lifetime.

Scientists today disagree on whethe plutonium would have increased patients' pain, worsened their condi or hastened their deaths. "I think a these exposures could cause excruci pain to the person who would suffe consequences," health physicist Mo said.

But Roland Finston, a health phy who just retired from Stanford Unive and helped The Tribune calculate the ation doses, said it's unlikely the would have caused any immediate effects. The real danger, he said, w have been the development of leuke solid tumors in later life. "It woul have caused any measurable effect o patients at the time or shortly therea he said.

The government said later deaths unrelated to the plutonium injection said there was no evidence to sugge plutonium influenced the pat diseases or caused cancer.

"The observation that cancer di apparently, develop in any of the injected patients does not mean th

With Elmer ailing, Fredna had to carry much of the load of raising two children. "It took something away from me. I haven't done all the things I could have done."

Eileen Welsome

doses given were too small to cause cancer," said John C. Cobb, a retired physician living in Corrales. "The plutonium may indeed have caused a cancer to start in any, or all, of these patients, but the patients' own immune systems could have eliminated the cancer cells."

Cobb is a former chairman of the University of Colorado's department of preventative medicine and served on a governor's task force that looked at health effects from plutonium and other problems at Colorado's Rocky Flats nuclear weapons plant.

Cobb said plutonium's irradiation of the bone marrow also could have damaged the patients' immune systems and made them more susceptible to diseases. "Immune deficiency can contribute to a great variety of symptoms," he said.

• • •

Many years later, when Elmer was back in Italy, Texas, he would tell his old friend Joe Speed about the doctors who raced in and out of his hospital room the summer his leg was amputated.

"They were practicing to be doctors," Speed recalled. "They were students. Different young men would come in, telling him to do this and that.

"He told me they put a germ cancer in his leg. They guinea pigged him. They didn't care about him getting well. He told me he would never get well."

Doctors at the clinic were immediately interested in Elmer. "Of great teaching value," a medical official wrote on Elmer's chart after an early visit.

Patricia Durbin, a scientist at Lawrence Berkeley Laboratory in California, said the patient selection was both "personalized and random."

"The bulk of the people were just people," she said.

Durbin was in a second generation of scientists who "rediscovered" the plutonium experiment and lobbied in the early '70s for follow-up studies. In 1946, she was a young student working in the lab of scientist Joseph Hamilton, one of the experiment's architects.

"They were always on the lookout for somebody who had some kind of terminal disease who was going to undergo an amputation," Durbin said. "There are not very many of them. But they had colleagues at UC-San Francisco and San Francisco General who were kind of on the alert for potential cases."

About a month before Elmer was admitted to the hospital, a Chinese boy described in documents as "CAL-A," underwent a similar injection and amputation. The 16-year-old boy was injected on June 10, 1947, with americium, another radioactive element, at what records described as the "Chinese Hospital" in San Francisco.

Two days later his leg was amputated. He was taken to the University of California Hospital in San Francisco for studies before and after the amputation. He died 11 months later and is buried in San Francisco. "There was no evidence of disclosure in the chart of this patient," said DOE records obtained under the Freedom of Information Act.

When asked if she knew anything about that case, Durbin said, "His guardian couldn't speak English. He got treated in a good hospital as a consequence."

• • •

On July 18, 1947, the white cast placed on Elmer's left leg after the biopsy was split down the side and removed to prepare for the "tracer injection."

"Some throbbing pain but no other discomfort," a doctor wrote in Elmer's records.

At 3:30 p.m. that day, medical people gathered at Elmer's bedside. He was told of a procedure they were about to perform.

"The experimental nature of the intramuscular injection of the radioactive tracer sample was explained to the patient, who agreed upon the procedure. The patient was in fully oriented and in sane mind," his medical records state.

Three doctors and a registered nurse witnessed the explanation, assisted in the injection and signed their names at the bottom of Elmer's consent form.

One doctor who signed his name was Bertram V.A. Low Beer, another early nuclear pioneer who used radioactive substances in medical treatments. Low Beer's name shows up in Elmer's medical records only on the day he was injected. The consent form also appears to have been written by Low-Beer.

Elmer is the only patient for whom there is documented evidence that he was told of the injection. The consent form, however, does not describe what he was told. Even then, Elmer's consent didn't come close to today's strict guidelines for informed consent, which require written acknowledgment by the patient after full disclosure of the research, its risks and benefits.

Fredna questioned why doctors did not include her when they discussed the experimental procedure with Elmer. "It seems like they should have told me about it," she said.

Elmer's daughter, Elmerine, said her father, with his limited education, would not have understood the explanation. "If they told my father that he was injected with plutonium, that would be like telling him he was injected with ice cream," she said. "He would not know the difference."

WHAT IS PLUTONIUM?

Plutonium is so lethal that even God didn't dare make it, anti-nuclear proponents say. Yet scientists who work with plutonium every day point out that we all probably have more than a few plutonium molecules in our skeletons as a result of the hundreds of nuclear weapons tests conducted in the '40s, '50s and '60s.

"It's got a bad reputation, but you can't find any cancers that you can attribute to plutonium in human beings," says James N.P. Lawrence, a scientist in health physics at Los Alamos National Laboratory.

J. Newell Stannard, a professor emeritus at the University of Rochester in New York and adjunct professor at the University of California, San Diego, said plutonium's bad reputation stems in part from "hysteria" and partly from the fact that someone in the '40s described it as the most toxic element known to man.

"What we should say is that it is one of the most effective carcinogenic elements known. There are many more toxic elements," he said.

John Gofman, a professor emeritus at the University of California, Berkeley, and one of the world's leading experts on the dangers of low-level radiation, rejects the idea advanced by mostly weapons-plant scientists that plutonium can't be linked to cancer in man.

In his book "Radiation & Human Health," Gofman says thousands of pounds of plutonium radionuclides injected into the atmosphere through 1962 have returned to Earth. And he estimates that the plutonium fallout will cause an estimated 950,000 lung-cancer deaths worldwide.

Plutonium's danger to future generations is even greater, Gofman said in an interview. "It's a very potent disrupter of genes and chromosomes. This effect will be far worse than the cancer effect because of the diseases -- including cancer, heart disease and schizophrenia -- it will produce in future generations."

The following are common questions about plutonium:

Question: What is plutonium?

Answer: It's the 94th element of the Periodic Table. Plutonium, named after the planet Pluto, is a man-made element and one of the densest substances known, with a melting point of 640 degrees centigrade. It is capable of igniting spontaneously when exposed to air.

Question: When was it first made?

Answer: In 1941 at the University of California, Berkeley.

Question: What is the most commonly used form, or isotope, of plutonium today?

Answer: Plutonium 239, which is capable of sustaining a nuclear chain reaction. That is the key to its use in nuclear weapons and for nuclear-power production. Plutonium 238, which is much more radioactive, is used for heat sources and electric generators in space.

Question: Why is it so dangerous?

Answer: Plutonium emits from its nucleus an extremely high-energy alpha particle, which is composed of two protons and two neutrons. Although alpha particles can't penetrate a piece of paper, they pack a tremendous punch to human cells, which can damage or kill them.

Question: What's this energy called?

Answer: The energy is called ionizing radiation, a process in which negatively charged electrons are separated from their neutral atoms. Think of what happens when the cue ball strikes a carefully racked triangle of billiard balls. Once an electron is knocked out of orbit, it careens great distances, breaking the intricate latticework of chemical bonds in the body and producing new chemical reactions, especially in cell nuclei.

Question: How many alpha particles are needed to create a cancer?

Answer: There's no "minimum dose." It's a chance phenomenon. The first alpha particle or the hundred-millionth could be the one that causes the crucial mutation that leads to cancer. Thus any amount of plutonium, however small, can potentially cause cancer.

Question: What are some other health effects?

Answer: Cell culture experiments suggest that exposure to alpha particles can lead to chromosomal instability that could affect future generations.

Question: How long does plutonium remain in the environment?

Answer: Plutonium 239 has a half-life of 24,065 years. That represents the time it takes for half its radioactive atoms to decay into another element. It will take another 24,065 years for half of the remaining plutonium to decay, and another 24,065 years for that half to decay, and so on. Depending on the original pile of plutonium and other factors, it could take as long as 500,000 years to get rid of all but one-millionth of the original pile. If you had a lot of plutonium in the original pile to begin with, one-millionth still could represent a lot of radioactive plutonium.

* * *

[illegible]

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[illegible]

> "The fact that they were injected and provided this valuable data should almost be a sort of memorial rather than something to be ashamed of. It doesn't bother me to talk about the plutonium injections because of the value of the information that they provided."
>
> Patricia Durbin
> Lawrence Berkeley Laboratory

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THE CHRONOLOGICAL STORY

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1991

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> **"It is desired that no document be released which refers to experiments with humans and might have adverse effect on public opinion or result in legal suits. Documents covering such work should be classified 'secret.'"**
>
> U.S. Army Corps of Engineers memo, 1947

many hopes and dreams for his family," Fredna recalled.

He cleaned bricks in nearby Dallas, repaired shoes at Goodwill Industries, upholstered chairs and sometimes plowed the rich, dark soil farmers called "black gumbo," friends said.

Mostly, it was up to Fredna to hold the family together. For 35 years she taught school, much of the time at Stafford Elementary, which was within walking distance of their small house.

Fredna, a poet in her spare time, thinks she never lived up to her potential, in part because of the pressure of raising two children and taking care of Elmer. "It took something away from me. I haven't done all the things I could have done."

Elmer's now-married daughter, Elmerine, said her father got the best of care. "Anything he wanted, he got it. He had an automobile to drive, it wasn't always a new one. Whatever he had, my mother provided it."

Elmer made toys for schoolchildren, totes from brown paper bags, lampshades from Popsicle sticks and flower baskets from egg cartons. His son, William, and his granddaughter, April, would go on to become engineers. "He could do anything. But there was nothing for him to do," recalled Speed, Elmer's friend.

A job at Goodwill ended when Elmer began having epileptic seizures and it was no longer safe for him to commute to Dallas. Fredna would put a tablespoon in his mouth when he had a seizure in the middle of the night. "He would chew the spoon to pieces -- his tongue, too," Elmerine recalled.

He had other problems. He drank alcohol "very, very heavily" until 10 or 12 years before he died, Elmerine said. He began taking Thorazine, a drug used in the treatment of various mental disorders. For some reason, it halted the drinking, she said.

David Williams, a physician in nearby Waxahachie, was Elmer's family doctor for the last 20 years of his life. Williams said he diagnosed Allen as a paranoid schizophrenic.

"This paranoia was certainly helped and did center around his feeling that he had been utilized as a younger man with this exposure to plutonium," he said.

"What I saw was a fellow who had a loss of limb and became an emotional cripple because of it. He took to the bottle and then got off that. He probably had paranoid schizophrenia all of his life. As far as doing things, I thought he was using this possible exposure as a crutch, a reason, rather than quite doing as well as I would have like to have seen him do."

Elmer told Williams on his first office visit that he had been injected with plutonium. "It was difficult to tell whether to believe him or not. I wondered," Williams said. "I also wondered if it was a portion of his paranoia and whether or not it was a crutch for him not to function as he should have functioned. His conscience needed a salve to where it was OK for his wife to be teaching and earning and so forth."

Williams said he never saw evidence that the plutonium had any physical effect on Elmer. He said he didn't encourage Elmer to talk about the experiment. "I didn't think there was a lot of gain there. Do you follow? In other words, I didn't turn him off, I'd listen, but I felt like he had other, more ongoing problems that were more pressing that we needed to deal with day to day rather than going back to that."

• • •

It was the evening of June 9, 1973. Elmer and Fredna were in Car 1635, Drawing Room D of the "Texas Chief," an overnight train bound for Chicago. Elmer had worked as a railroad porter many years earlier, so the sway of the train and the clacking rhythm of the rails must have cradled him like an old rocking chair.

Then there was the view from his window. Weedy back lots and wash hanging from clothes lines as the train pulled out of Fort Worth. Cows, horses and barns hurtling by. Green pastures unspooling like dreams. And later, the lights. Everything chattering of those old railroad days.

The next day, they were met in Chicago by a limousine driver at Union Station and whisked to a Ramada Inn, where a bouquet of flowers awaited them.

The Allens were on the trip of their life, a 19-day whirlwind that would take them to Chicago and then hundreds of miles northeast to Rochester. Limousines, fresh flowers, private train compartments and immaculate hotel rooms awaited them. And the government scientists were actually going to pay them $140 for participating in follow-up studies plus $13 a day.

On the day after their arrival in Chicago, Fredna went sightseeing. Elmer went to a sprawling national lab near Chicago. There he was placed in a whole-body counter, and his urine was collected and studied for traces of plutonium from a long ago injection.

Against the festive backdrop, Elmer's unwitting participation in the second phase of an experiment launched almost 30 years earlier began. A new generation of researchers carried forward a cover-up initiated by the Manhattan Project scientists.

Neither Elmer nor Fredna nor their family doctor learned of the real purpose of the trip until a year later, formerly classified documents show. Eda Schultz Charlton and John Mousso, two other patients injected with plutonium many years earlier, also were unknowing participants in the follow-up studies, which involved the collection and chemical analyses of urine, stool and blood samples. Relatives of deceased patients whom scientists also wanted to exhume were duped, records show.

"My mother thought this was big stuff coming from Italy, Texas," Elmerine said of her parents' trip. "She thought she was the queen of England. It wasn't like they said, 'We're testing you guys because we injected you with plutonium.' "

• • •

Chicago, the place Elmer and Fredna were bound for that warm summer night, was the city where it all began. While working as a railroad porter many years earlier, Elmer fell from a train and injured his leg, which eventually led to an amputation.

Doctors said the leg had bone cancer, a disease which is normally fatal in five years. But Elmer was to live another 44 years, which makes the original diagnosis suspect, one scientist said.

"If the diagnosis had been correct, by rights he should have been dead in five years or something like that," said retired scientist John Rundo. "Bone cancer is normally fatal, not universally, but usually. He didn't die, as you know, so one can conclude that he probably didn't have bone cancer." Rundo oversaw the chemical analyses done on the excretion samples taken from Elmer and the others in 1973.

Durbin, the scientist from Lawrence Berkeley Laboratory in California who reviewed Elmer's medical records, also said she doubted the accuracy of "CAL-3's" diagnosis.

"I think the diagnosis of the bone cancer was questionable," she said. "The cells were not convincingly tumorous, at least on my reading of the pathology report."

But in a later interview, she said she believed "CAL-3's" leg still would have required amputation. "They were going to have to take the leg off anyway because the knee was so badly shattered. It hadn't healed well."

In 1967, Durbin learned that at least one patient injected in the 1945-47 experiment had lived at least 20 years, and she began a concerted effort to find out what happened to the rest.

Two decades earlier, she was a young student washing beakers in the laboratory of Hamilton, one of the country's savviest scientists about the biological effects of plutonium.

Durbin, a plain-spoken scientist in her mid-60s, is a staunch defender of the project and says the data saved countless people from being overexposed in the workplace. She said the international community still uses the data to set limits for human exposure to plutonium.

"These things were not done to plague people or make them sick and miserable," she said. "They were not done to kill people. They were done to gain potentially valuable information.

"The fact that they were injected and

THE ACID TASTE OF PLUTONIUM

Los Alamos chemist Don Mastick accidentally gulped a ricocheting blob of plutonium 49 years ago. If you find that hard to swallow, consider this. Mastick is now 73 and says he suffered no ill effects.

"It's easy to assume plutonium's the most poisonous thing in the world, but I'm walking proof you can roll in it, wash yourself off and come out of it," said Mastick, who is retired and lives in Saddle River, N.J.

According to formerly secret memos, the explosion involving Mastick appears to be one of the incidents that led to the experiment in which 18 patients were injected with plutonium.

In August 1944, Mastick was a "bushy-tailed kid" in the chemistry lab at Los Alamos National Laboratory. As the lab's only "ultra-micro chemist," Mastick was studying the properties of plutonium, a super-secret substance known then as "the product."

Los Alamos' entire supply of plutonium was stored in a little glass vial about one-quarter inch in diameter and a few inches long. The vial was sealed by using a flame to close off a small tube protruding from it. The plutonium was so radioactive that the solution was converted to gases, Mastick said.

"When I went to do some work one day, the gases forced it to shoot right out of the little-bitty tube. It bounced off the immediate wall in which it was pointed and into my mouth, which I tasted because it was acid," Mastick said.

Realizing how valuable the plutonium was that he had just swallowed, Mastick, who was then 22, said he went "trotting" over to Louis Hempelmann's office, a scientist in charge of health issues at the lab.

Hempelmann pumped out his stomach.

"He handed me some waffles and said, 'Go retrieve it (the plutonium),' " Mastick recalled.

Mastick said it was estimated that he received 25 times the lethal dose of plutonium from the explosion. For many years, Los Alamos sent him bottles in which he would put his urine samples and ship them back to the lab.

"For 15 years, my urine was radioactive," Mastick said. "I could blow on a meter, and it would send that off the scale. It was coming out of my lungs, too."

After the accident, Director J. Robert Oppenheimer put Mastick in charge of analyzing the urine specimens from other lab employees. "After six months, I told Oppy I wanted to go overseas and work with the group dropping the bomb."

Mastick got his wish and soon left Los Alamos.

Mastick said he didn't realize how concerned Los Alamos officials were about the medical effects of plutonium. "They never queried me directly," he said.

He said he also knew nothing about the plutonium experiment.

"Good Lord," he said. "I guess I got out of their clutches too fast."

Elmer never wanted to return to Italy, a small town south of Dallas that goes into a reverse kind of hibernation when the fierce Texas heat strikes. In 1973, Elmer and Fredna went on a whirlwind trip to Chicago and Rochester, N.Y. Financed by Argonne National Laboratory, the trip included limousines, fresh flowers, a $140 participation fee and $13 per day. But scientists didn't tell them the true purpose of the trip.

[illegible]

provided that valuable data should almost be a sort of memorial rather than something to be ashamed of. It doesn't bother me to talk about the plutonium injectees because of the value of the information that they provided."

In late December 1972, Durbin turned the information she had gathered over to the now-defunct Center for Human Radiobiology at Argonne National Laboratory near Chicago. This was the organization that had followed the radium dial painters, the women who died of cancer after licking the radioactive brushes they used to paint watches.

It was decided that survivors' urine, blood and stools would be gathered on the metabolism unit of the University of Rochester's Strong Memorial Hospital. The Center for Human Radiobiology would do the chemical analyses.

Scientists also wanted to study the remains of deceased patients. Over the next five years, they exhumed three bodies and obtained the ashes of a fourth patient.

The MIT Radioactivity Center in Phoenix was in charge of getting permission for the exhumations from relatives. The staff there had done similar work in tracking down radium dial painters and other people exposed to radioactive elements.

The arrangement suited officials at Lawrence Berkeley Laboratory just fine. "The introduction of exhumed bodies into the politically charged Berkeley atmosphere might even result in picketing of the laboratory by students," a worried official is quoted as saying in the AEC report.

Los Alamos National Laboratory, which played a key role in the first phase, took a supporting role in the 1973 follow-up. Some samples from the 1973 studies were sent to Los Alamos, but Los Alamos scientists, particularly Langham, wanted to keep out of it the second time.

Langham, who performed the initial chemical analyses from 11 Rochester patients and an Oak Ridge accident victim, had grown weary of being identified with the experiment, Durbin wrote in a 1971 letter. He was distressed in particular that the Rochester patients had never been told they were the subjects of an experiment and resented the pervasive influence the project had on his entire professional life, Durbin wrote. "He said if such material were available, the Los Alamos group would be interested in participating, but that they did not want to be directly responsible nor in direct contact with whomever was actually obtaining samples," the letter states.

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Elmer and Fredna's trip to Chicago and Rochester began with a March 7, 1973, letter to their family doctor, A.O. Dykes, from Argonne National Laboratory.

"We are trying to locate a patient of yours by the name of Elmer Allen in order to do a follow-up study on treatment he received for a sarcoma in July 1947," wrote Austin Brues, medical director of Argonne's Center for Human Radiobiology.

"We are especially interested in cases of this sort, and his is of particular interest since he has this unusual malignant tumor and has shown such a long survival time," Brues wrote.

"Please assure him it would only be for observation and collection of excreta," he added. Nowhere in the letter is plutonium mentioned, a substance an AEC official later would point out dryly was not given for therapeutic reasons.

Elmerine, grown and with a family of her own at the time, remembers her parents' excitement. "It was like it was going to be an adventure. My mother called. She said, 'You know, I got this letter from this doctor that was one of your dad's doctors when he had his leg amputated in California. When she found out your father was still alive, she was just amazed and what they wanted to do, they wanted to see if we will come to the University of Rochester in New York to run some metabolism tests.'"

> **"Please note that outside of CHR we will never use the word plutonium in regard to these cases. 'These individuals are of interest to us because they may have received a radioactive material at some time' is the kind of statement to be made, if we need to say anything at all."**
>
> Robert Rowland
> Director, Center for Human Radiobiology,
> Argonne National Laboratory

Scientist Rundo recalled seeing the patients. "I looked at them. I saw people who were in reasonably good states of health, considering their ages, considering one had lost a leg 27 years earlier. These were normal people, nice people." The plutonium in Elmer was barely detectable. "His excretion rate was extremely low," Rundo said.

After the tests at Argonne, the Allens rested a day and then boarded a bus to Rochester, where another limousine took them to their hotel. Elmer spent 14 days in the metabolic unit at Strong Memorial Hospital. Fredna kept several souvenirs of the trip, including a Polaroid snapshot of Elmer with a doctor she identified as Christine Waterhouse. A couple of the medical people even gave her their autographs. One was a scientist whose name appears in scientific papers describing the plutonium found in the hair and bones of exhumed corpses.

Fredna said she had no idea what the doctors were doing. "Every time I went to see him, he was in bed. They would study the food he would eat," she said.

For two weeks, Elmer ate the same kind of food. His urine and stool samples were gathered regularly. On the day he was to be discharged, he had a seizure. They stayed an extra day.

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On April 17, 1974, more than a year after Elmer had been sent home, the AEC's Division of Inspection and the Biomedical and Environmental Research Division began an investigation. The resons for the inquiry are not clear.

A detailed report of the findings later was prepared and classified "Official Use Only." The DOE now says it doesn't have the report, but The Tribune obtained a copy from a former Capitol Hill staffer. In the report, the DOE deleted the names of patients, doctors, scientists and investigators. The internal inquiry focused mostly on:

- Whether patients in the 1945-47 period had given their informed consent for the experiment.
- Whether the survivors in 1973 were properly informed of the true purpose of the follow-up studies and gave their informed consent.
- Whether the relatives of the deceased patients were properly informed about the exhumations.

The answers were no, no and no.

Investigators fanned out across 14 cities, examining records and talking to scientists involved in both phases of the experiment. More than 250 documents were copied and brought back to AEC headquarters. The investigation uncovered a web of deceit that dated back 50 years. The investigators found:

- No written evidence that any of the patients were informed of the original plutonium injections or gave their consent. Witnesses claimed some patients were told orally they were going to receive a radioactive substance, but plutonium was a classified word at the time. Elmer was told only that he was to receive a radioactive substance.
- In 1973, survivors Elmer, Eda Schultz Charlton and John Mousso were not told the true reason scientists were interested in studying them. They also did not give their informed consent for the studies even though Argonne National Laboratory, as contractor with the AEC, had agreed to abide by regulations requiring such consent for human studies. Robert Loeb, spokesman for the University of Rochester Medical Center, said the hospital didn't require patients to sign informed consent forms because they were involved in excretion studies only.
- The relatives of the dead patients also were deceived or lied to about the true purpose of the exhumations.

One of the documents that illustrated the extent of the cover-up was the last paragraph of a Dec. 21, 1972, memo written by Robert Rowland, a retired scientist who at that time was director for the Center for Human Radiobiology.

"Please note that outside of CHR we will never use the word plutonium in regard to these cases. 'These individuals are of interest to us because they may have received a radioactive material at some time' is the kind of statement to be made, if we need to say anything at all." (The words "never" and "plutonium" are underlined in the memo.)

Rowland, who still lives in the Chicago area, said in an interview that he was given those instructions "orally" by officials in Washington, D.C. "We were not in any way, shape or form to allude to plutonium," he recalled.

A.F. Stehney, another scientist from the Center for Human Radiobiology involved in the follow-up studies, said the plutonium patients weren't told the truth because everybody was "leery of getting these people all excited."

"We were told these people were pretty elderly and might get very upset if we started talking about radioactivity in their bodies."

While scientists were contacting living survivors about follow-up studies, others were trying to secure permission from relatives of deceased plutonium patients for exhumations. Here's what they agreed to tell relatives:

"An appropriate approach would be to say that the center was investigating the composition of radioactive materials that had been injected at an earlier date in an experimental type of treatment; and that since the composition of the mixture was not well known, there would be considerable scientific interest in investigating the nature of the isotope and the effects it may have had."

On Sept. 24, 1973, the body of a 20-year-old woman identified in official records as "HP-4" was exhumed. The patient's sister had given permission for the exhumation. "Since the sister did not inquire as to the reason for the injections, the issue was not broached," the AEC report revealed.

The relatives of seven deceased patients eventually were contacted. None was told the real reason, AEC investigators found. "Disclosure to all but one of the next of kin could be judged misleading in that the radioactive isotopes were represented as having been injected as an experimental treatment for the patient's disease," the report says.

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After the investigation, the AEC ordered that survivors be told the truth. Relatives of the deceased patients also were to be recontacted and told.

In May 1974, Bruce, the medical director of the Center for Human Radiobiology, took a night flight to Dallas. There, he met another AEC official and the two of them drove to Milford, Texas, to tell Elmer's physician the truth behind the studies done a year earlier.

"I told him we found that the patient had received plutonium into the muscle of the sarcomatous leg three days before it was amputated, not enough in our belief to cause any trouble or to have any effect on the tumor, but that he should be carefully followed in any case because of the very small number of such cases that are inv-

THE COVER-UP CONTINUES

A cover-up that began at the dawn of the Atomic Age shows no sign of ending in the ashes of the Cold War.

Though nearly half a century has elapsed, the Department of Energy, the federal agency that inherited many functions of the wartime Manhattan Project, still refuses to reveal the identities of most of the patients injected with plutonium.

On Nov. 20, 1989, The Tribune made its first request to the DOE under the Freedom of Information Act for all documents related to the experiment.

For four years, the sprawling agency has stalled. It has released some documents but mostly has withheld critical records such as medical files and other paperwork identifying the patients.

Through the years, DOE has given a variety of reasons for refusing to release records, ranging from privacy concerns to saying it doesn't possess the documents.

The stonewalling has continued despite Secretary of Energy Hazel O'Leary's promise last spring that the department would begin systematically declassifying health and safety information for public scrutiny.

"People simply don't trust us in the Department of Energy," she said. The DOE's attitude should be, "'We don't have any data that you can't have,'" she said.

While the rhetoric has improved under the Clinton administration, Don Hancock of the Southwest Research and Information Center said he has seen no evidence that the DOE is taking the Freedom of Information Act seriously.

"The DOE is a notorious violator of the FOIA," said Hancock. "It's a very long-term problem. They don't comply with the spirit or the letter of the law."

Officials at DOE headquarters in Washington, D.C., say they know nothing about the experiment. "You're asking me to take your word that this happened," spokesman Sam Grizzle said recently.

"I have no knowledge of this whatsoever. It probably happened years before I was born, so I don't have any historical files here to refer to whatsoever," he said.

Arjun Makhijani, president of the Institute for Energy and Environmental Research in Washington, D.C., said the plutonium experiment is important because it contains "a lot of lessons" for Americans. "It's very important that people derive the lessons and put appropriate safeguards in place to see these abuses don't happen again."

In response to The Tribune's original 1989 request, the DOE Albuquerque Operations Office said it couldn't find any records on the experiment, with the exception of one boilerplate contract. The Tribune received two documents from DOE offices in Chicago and Germantown, Md. Other than these minor documents, The Tribune received nothing, so the newspaper appealed.

Shortly after, The Tribune began to get phone calls from John H. Carter, the DOE official in charge of all the DOE's FOIA requests.

There were a couple of off-the-record discussions with Carter. Subsequently, The Tribune dropped its appeal and received a printout describing publicly available articles related to human beings and plutonium.

More than two years elapsed.

In July 1992, the search resumed for the identities of the patients. This time The Tribune's attorneys, the Baker & Hostetler law firm in Cleveland, filed a new Freedom of Information Act request.

The seven-page request was based in part on the skimpy documents received from the DOE. But the key to pinpointing specific documents was a 1974 inspector general report and related memos prepared by the Atomic Energy Commission, the DOE's predecessor.

The DOE, however, says today it doesn't have a copy of its own 1974 inquiry. But The Tribune got its copy from John Abbotts, formerly a special assistant to a U.S. House of Representatives subcommittee that in late 1986 issued a scathing review of how Americans had been used by the DOE as "nuclear guinea pigs."

The Energy Department has contended the patients' names and medical records can be withheld because of privacy laws. But under the Freedom of Information Act guidelines, privacy considerations don't apply when a person is dead.

The following is what has happened since Aug. 28, 1992, when The Tribune's second FOIA request was filed:

- March 1, 1993. John Layton, inspector general of the DOE, denies The Tribune's Freedom of Information Act request. He says his office has "no materials responsive to the request." According to records obtained from Abbotts, Layton is the same DOE official who in 1986 released the AEC report and other pertinent documents in an unrelated FOIA request.
- April 5, 1993. The Tribune appeals the DOE's inspector general decision.
- April 30, 1993. The DOE's Office of Hearings and Appeals upholds the DOE's inspector general. "We find the search conducted by the IG in this case was adequate."
- May 13, 1993. U.S. Rep. Steve Schiff writes DOE on behalf of The Tribune, asking it to speed up their review of records.
- May 26, 1993. The DOE sends two packages of records collected from its Albuquerque, Oak Ridge, Tenn., and San Francisco offices. Many are triplicate and quadruplicate copies of reports and memos The Tribune had received three years ago, as well as scientific reports available through many university libraries. Nothing is provided from DOE's Chicago office — where the follow-up studies on the survivors and exhumed remains of the patients were conducted in the '70s. No patient names are included either.
- July 6, 1993. The Tribune appeals the May 26 response and demands information about how the search was conducted. "It is evident that a number of patient studies were conducted by agency officials during the 1970s and later, yet none of those studies was produced in response to the specific FOIA request," said Loretta Garrison, attorney for The Tribune.
- Aug. 3, 1993. The Tribune demands the DOE retrieve all the records related to the plutonium experiment mentioned by Patricia Durbin, a scientist at Lawrence Berkeley Laboratory. Durbin had told The Tribune in an interview, "Nothing at Berkeley is ever thrown away."
- Oct. 1, 1993. The DOE's Chicago Operations Office sends The Tribune items purportedly responsive to six items. There's only one hitch: The documents are copies of DOE documents that The Tribune had included in its 1992 Freedom of Information Act request. DOE officials say they don't know how the mix-up occurred.
- Oct. 8, 1993. The DOE's Chicago office finally sends five documents. For the first time, the documents include the name of a patient: Elmer Allen. But The Tribune had uncovered Elmer Allen's identity more than a year earlier.

ing," Brues said.

Elmer's physician, Dr. Dewey H. Roberts, who was then 80 years old, thought the plutonium might have cured the cancer, Brues said. "Dr. Roberts was quick to form the belief that the injection may have cured the tumor. We tried to cool this but with questionable success. (I had given warning of this possibility before accepting the assignment.)," Brues wrote.

The Center for Human Radiobiology was "extremely anxious" to do an autopsy when Elmer died. It also wanted permission to check him again at intervals, Brues told Elmer's doctor.

Roberts assured the Chicago scientist he would be happy to cooperate and wanted advice on whom to call in case of serious illness or death. "He said these old fellows with hypertension, in his experience, are likely to go to sleep some night and not wake up," Brues said.

"We asked Roberts to tell the patient about the nature of the injection as he has a right to know. The records seems to indicate only that he gave voluntary consent to an injection of radioactive material," Brues said.

After the visit with Roberts, the two officials paid a "social visit" to Elmer. "Our visit was welcome, his wife was taking her grade school class to the zoo in Dallas, he is moving into the new house, finest in the area, apparently somewhat financed by his two children who he visited when in the North," Brues said.

The two scientists didn't tell Elmer of the plutonium injection but advised him to talk with Roberts about a discussion they had had with him. Elmer told the two officials he would be happy to return for a "recheck" provided he didn't have to fly.

In a follow-up discussion, Elmer's doctor confirmed to AEC officials that Elmer had been told of the injection. "The patient was aware of the injection and wasn't much concerned although he did not know what it was that had been injected," the AEC report quotes Elmer's doctor as saying.

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In the spring of 1974, James Liverman, a DOE official, met with Robert Berry, Army general counsel, and Brig. Gen. R.W. Green, the deputy surgeon general of the Army, to tell them they planned to inform the plutonium survivors of the long-ago injections.

"General Green was considerably concerned that no good was to be achieved in his view by surfacing a whole series of issues when nothing could in fact be done at this point in time with regard to changing those issues and that the patients or their relatives might in fact be worse off because of the public, social or psychological trauma," Liverman stated.

AEC officials also became worried in the mid-'70s about how to explain the experiment — should it ever become public.

But word eventually got out. In 1976, the experiment was reported in a Washington, D.C.-based newsletter called Science Trends. The Washington Post also reported the story on the front page on Feb. 22, 1976.

In the Post story, an unnamed official said the department "had no plans to launch an investigation to try to learn more about the injection program." What the unnamed energy official didn't say was that an investigation had just been concluded two years earlier.

Courtesy of Fredna Allen

Despite the hardships, Elmer and Fredna's marriage survived. Fredna taught school, and Elmer took odd jobs when he could find them. Elmer received no money from the federal government for his participation in the experiment, despite a congressional subcommittee's recommendation that every effort be made to track down and compensate America's "nuclear guinea pigs."

The DOE records dwindle after 1974. Unsigned, handwritten slips of paper kept score of how many patients were still alive as the years went by. The decision to discontinue the almost 30-year-old experiment remains, in some ways, as mysterious as the decision to launch the project.

Stehney, one of the scientists involved in the later studies, said things just became too difficult. "There were things we didn't feel comfortable with. We thought we had done as much as could be done at that point."

Rundo, also involved in the follow-up studies, said it was his "vague" recollection that DOE told scientists to stop their investigation. "I think it was the lawyers who were concerned. They were afraid the families might sue," he said.

But Berkeley scientist Durbin tells a different story. "Someone went to talk with one family and made misrepresentations.

"Those of us when we heard about that concluded the waters had been muddied, and we needed to let more time pass, let tempers cool. I was very angry that had happened," she said.

• • •

The plutonium experiment topped a litany of human experiments in a report issued in the late 1986 by the U.S. House of Representatives subcommittee on Energy, Conservation and Power. U.S. Rep. Edward J. Markey, a Massachusetts Democrat who chaired the subcommittee, compared the tests conducted by the DOE and its predecessors to the "kind of demented human experiments conducted by the Nazis."

"Documents provided by the Department of Energy reveal the frequent and systematic use of human subjects as guinea pigs for radiation experiments," the opening sentence of the report says.

Markey urged the DOE to make every effort to find the patients, follow up on radiation-associated diseases and to compensate "these unfortunate victims" for damages. The AEC, after its 1974 internal investigation, also recommended survivors be given medical surveillance, with the AEC or Department of Defense picking up the tab.

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But there was no pot of gold waiting for Elmer Allen, no government men who came to Italy in his waning years to try to make good.

Fighting his real and imagined ghosts, Elmer lived almost another five years after the subcommittee published its findings. Elmer died on June 30, 1991, of respiratory failure caused by pneumonia. He was 80 years old. On his death certificate, his occupation was listed as Pullman porter.

He spent some of his last days in silence at Italy's nursing home, a quiet place shaded by a large cottonwood tree. There, among the other aged residents, the cheerful nature of the amputee described by surgeons so many years ago was still evident.

"I knew he didn't want to be here, but he wasn't mean to us because he didn't want to be here. He tried to do quite a bit of stuff for himself," said Alethea Brown, a licensed vocational nurse at the Italy Convalescent Center.

"He wasn't a conversation starter. He would talk to you if you talked to him. I just never asked him how he lost his leg." ❑

IN MEMORY OF ELMER

Inside Elmer's funeral pamphlet

STEAL AWAY TO SOME SECRET PLACE

When my heart is heavy and my burdens
hard to bear,
And there's no earthly being with
whom my load to share,
I steal away to some secret place
and have a talk with God,
For He is the One who knows the path
these weary feet have trod.

While in this secret chamber on bended
knees I pray,
"Lord, keep me in the path of righteousness
on this and every day,
Deliver me from all evil and let
Thy will be done,
Grant me a home in Thy kingdom when
this race of life is run."

As I quietly and tearfully kneel there,
He gently lifts my head,
And gives me strength and courage
to keep on down the road,
Toward that Celestial City with its
beautiful pearly gates,
Where my Savior and my loved ones
for me await.

So when your burdens are heavy and
storm clouds darken your way,
When friends have turned their backs
and all manner of evil they say,
Just when you think all hope is gone
and your load you cannot bear,
Steal away to some secret place and
...pray, God is always there.

—Fredna Hadley Allen

THE MINDS BEHIND THE EXPERIMENT

Everyone seemed to agree that intensive study was needed. But it's tough to tell exactly who authorized human plutonium experiments.

The Associated Press

GLENN SEABORG:
Urged program to trace plutonium in the body

University of Rochester Medical Center

LOUIS HEMPELMANN:
Said studies were "urgently needed"

Los Alamos National Laboratory

J. ROBERT OPPENHEIMER:
Favored studies, but didn't want them at Los Alamos

In the summer of 1944, as scientists on a windswept plateau in Los Alamos rushed to complete a bomb more powerful than 10,000 tons of TNT, an accident occurred in one of the labs.

Ten milligrams of highly radioactive plutonium — about 1/10,000th of a teaspoon — exploded in the face of a chemist named Don Mastick. Mastick, who swallowed a small amount, is still alive.

But in the weeks after the explosion, Mastick's fellow scientists were horrified that medical officials had no way of determining how much plutonium was in Mastick's body or how serious the dose was.

The accident led to a flurry of memos between Director J. Robert Oppenheimer and Louis Hempelmann, Los Alamos' first health group leader. Meetings were held with top medical officials of the Manhattan Project.

Out of that came a biological research program that called for the injection of plutonium into a human being, according to formerly secret memos from Los Alamos National Laboratory.

Los Alamos played a major part in the plutonium experiment, analyzing excretion samples from 11 patients injected at Strong Memorial Hospital in Rochester, N.Y., and one patient at a military hospital in Oak Ridge, Tenn.

But the experiment appears to have been a cooperative effort among the scientists working at nuclear labs around the country.

Not only were Los Alamos scientists clamoring to trace the course of plutonium in the human body, but so were atomic researchers in Chicago, Berkeley, Calif., and Tennessee.

In the rush to build the atomic bomb, not only rank-and-file workers, but the scientists themselves — the so-called "long hairs" — inadvertently were being exposed to plutonium. And as one researcher put it, the loss of scientists would be akin to losing generals in an army.

It was an experiment everybody wanted. But afterward, nobody wanted to claim credit for it. "Everybody was nervous as cats about the fact that these people had been injected without their knowledge," said Berkeley scientist Patricia Durbin.

The late Stafford Warren, chief of the Manhattan Project's medical section under Army Gen. Leslie Groves, is credited as the person "primarily responsible" for the initiation of the program, according to a 1950 Los Alamos report. But other DOE documents say Warren, a native of Maxwell City, N.M., who went on to become the first dean of UCLA's medical school, wasn't really the sponsor.

Hymer Friedell, a physician who is retired and living in Cleveland, worked as Warren's assistant during the war. Friedell said Warren approved the experiment but did not necessarily initiate it. "Often experiments were initiated by various investigators. If it looked reasonable and would make a contribution to the war effort, it was approved," Friedell said.

No one source explains exactly how the experiment unfolded. The following are excerpts from documents that make reference to human experimentation with plutonium:

- Jan. 5, 1944: Glenn Seaborg, Nobel laureate and co-discoverer of plutonium, writes a memo to Robert Stone, a health official at Chicago's Met Lab, warning that "even very small amounts" of plutonium in the body could prove dangerous.

"I would like to suggest that a program to trace the course of plutonium in the body be initiated as soon as possible. In my opinion, such a program should have the very highest priority."

But in a telephone interview from his Bay area home, Seaborg said he knew nothing about the human experi-

"We thought the experiment was outrageous. I don't think they really discovered terribly much. ... It's difficult to arrive at a firm conclusion about the metabolism of plutonium from such a small sample size."

Katherine Yih
International Physicians for the Prevention of Nuclear War

"Everybody relies on this data. This is the single most-often-used set of numbers. Everything goes back to this one set of data. It's all there is."

Patricia Durbin
Lawrence Berkeley Laboratory

ments with plutonium. "Oh, God, no," he said. The memo referred to experiments with animals, Seaborg said.

- Feb. 8, 1944: Joseph Hamilton, a Berkeley scientist, receives 11 milligrams of plutonium for rat studies.
- Aug. 16, 1944: Hempelmann writes Oppenheimer, discussing the plutonium explosion and saying studies are urgently needed to develop ways of detecting plutonium in urine and stools and extrapolating how much is in the body.
- Aug. 16, 1944: Oppenheimer responds to Hempelmann, authorizing programs to develop methods of detecting plutonium in excreta and lungs.

"As for the biological sides of the work, which may involve animal, or even human experimentation, I feel that it is desirable if these can in any way be handled elsewhere not to undertake them here," Oppenheimer writes.

- Aug. 29, 1944: Hempelmann writes another memo to Oppenheimer summarizing a "biological research program" agreed to four days earlier with the Manhattan Project's Warren and Joseph Kennedy, head of Los Alamos' Chemistry-Metallurgy Division.

The third aspect of the three pronged program calls for "tracer experiments on humans to determine the percentage of plutonium excreted daily."

Once the analytical methods are worked out, further metabolic studies will be turned over the Atomic Energy Project in Rochester, the memo says.

- Dec. 2, 1944: Warren summarizes a medical experiment program investigating and comparing the effects of radium and plutonium in human beings and rats. Ratios between blood levels and urine and fecal excretions are to be established in rats after a "single intravenous injection."

Then, tracer experiments are to be done with humans "so that the comparison factor can be made between the rat data and human data," he writes.

- March 26, 1945: Hempelmann writes a memo to Oppenheimer about an earlier meeting in Los Alamos with members of Los Alamos' chemistry and medical groups.

Among other requests, the Los Alamos group asks the Manhattan Engineer District to help make arrangements for a human-tracer experiment to find out how much plutonium is excreted daily in the urine and stools.

"It is suggested that a hospital patient at either Rochester or Chicago be chosen for injection from one to 10 micrograms of material and that the excreta be sent to this laboratory for analysis," the memo says.

- March 29, 1945: Oppenheimer writes a letter to Warren to add his "personal indorsement (sic)" of the Los Alamos requests.

"We all have the feeling that at the present time the hazards of workers at Site Y (Los Alamos) are probably very much more serious than those at any other branch of the project, and that it would be appropriate that the medical program of the Man' ttan District consider some of our problems rather more intensively than they have in the past," Oppenheimer writes.

- April 10, 1945: The first human being, an Oak Ridge man with severe auto injuries, is injected with plutonium. ☐

University of Rochester Medical Center

STAFFORD WARREN: *The Manhattan Project official who is viewed as "primarily responsible" for the plutonium experiment smokes a cigarette as he interviews Japanese doctors in Nagasaki in September 1945 to get first hand information on the medical effects of the atomic bomb dropped there*

WAS IT WORTH THE RISK?

What did scientists learn after they injected 18 people with plutonium? Depending on who's talking, the information is priceless or worthless.

The idea behind the experiment was this: Inject a known amount of plutonium into terminally ill patients, plot the rate at which it leaves the body, then apply the excretion rates to workers accidentally exposed.

Manhattan Project scientists also were able to determine how long plutonium circulated in the bloodstream and where it was deposited in the human being from tissues samples taken from patients who died soon after the injections.

So theoretically, if healthy workers at Los Alamos National Laboratory inadvertently were exposed to plutonium, the scientists would gather samples of their contaminated urine and stools. Using the excretion tables from the earlier plutonium patients, they would try to extrapolate how much of the radioactive substance was in the workers' bodies.

"Everybody relies on this data," says Patricia Durbin, a scientist at Lawrence Berkeley Laboratory. "This is the single most-often-used set of numbers. Everything goes back to this one set of data. It's all there is."

But other scientists, including the International Physicians for the Prevention of Nuclear War, condemn the experiment. In a recent book, the group says the work was not only unethical but also of dubious scientific merit.

"We thought the experiment was outrageous," said Katherine Yih, a scientist and research coordinator for the book, which is titled "Plutonium: Deadly Gold of the Nuclear Age."

"I don't think they really discovered terribly much. There were a lot of variations among the individuals, and it's difficult to arrive at a firm conclusion about the metabolism of plutonium from such a small sample size."

Other critics say the excretion of plutonium varies too much from individual to individual to make the data reliable. Some of the patients were suffering from impaired liver and kidney functions, which would have further skewed excretion curves.

The information on the experiment became public at a time when the so-called "safe" standards for plutonium exposure were under attack and a large commercial demonstration reactor was about to be built using large amounts of fuel, recalled one Senate staffer on Capitol Hill. Pro-nuclear officials used the fact that none of the patients had come down with cancer to support their argument that standards didn't need to be lowered, he said.

But some patients could have died of diseases caused by immune-system damage before cancer occurred, some scientists say. The value of the experiment is even more dubious because most workers would likely be exposed to plutonium when it was accidentally imbedded in their skin or through inhalation. When inhaled, plutonium is far more dangerous than when it is injected.

Nonetheless, the data still have value, others say.

"All of the dose calculations that we've done are based upon the kinds of measurements done in this experiment," said Roland Finston, a health physicist who recently retired from Stanford University. Finston helped The Tribune calculate the radiation doses to each of the 18 patients.

"If you tell me there's a certain amount of activity in the bloodstream or lung, the only way the doses to the various tissues are going to be known is by this kind of experiment -- unless you want to rely on animal data."

Given that plutonium was going to be manufactured in large quantities in the future, the scientists might have been criticized for not trying to learn more about how plutonium was metabolized in the body, Finston said.

UNC

[redacted] SERIAL No. 33

~~22 December 1943~~ (5) 627 400 (18) (19)

NRL/~~Report No.~~ P-2208

NAVY DEPARTMENT

~~Report on~~

(6) Chamber Tests with Human Subjects
I. Design and Operation of Chamber
II. Initial Tests of Navy Issue Protective Clothing Against H Vapor.

(7/k " 7) NA

NAVAL RESEARCH LABORATORY
ANACOSTIA STATION
Washington, D. C.

Number of Pages: Text - 39 Tables - 22 Plates - 30

~~Authorization:~~ (16) Project ~~#~~547/41, ~~"Maintenance, Bureau of Ships", dated 16 December 1940; Bureau of Ships letter S-S77-2(Br), Serial 811 of 19 December 1940.~~

Date of Tests: August 1943 - November 1943

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ABSTRACT

This report ~~is divided into two sections. The first~~ deals with the design, calibration and operation of a chamber for the exposure of human volunteers to the vapors of chemical warfare agents. The construction of the chamber is such that the temperature, relative humidity and concentration of vapor of the chemical warfare agent can be controlled closely over a wide range of conditions.

The second part deals with the testing of Navy issue S-146 impregnated Arazen protective clothing, protective ointments and masks. Men dressed in water suspension, solvent and solvent + ZnO impregnated clothing have been exposed to H vapor at CT's ranging from 200 to 2500. A series of tests is in progress in which men dressed in the three types of suits have been exposed repeatedly to H vapor at a CT of 1200. No significant difference has been found in the protection afforded by these three types of suits. The effects of leakage of H through the suits is discussed.

The irritancy of S-461 and S-330 Protective Ointment when applied to the face, ears and neck of the men before exposure has been compared. S-330 is far less irritating than S-461.

The rubber of the gas mask face-pieces and connecting tubes absorbed enough H after 12 to 15 exposures to cause conjunctivitis, laryngitis and erythema of the face. The connecting hoses have been encased in impregnated cloth sleeves, and no break has been observed after 16 exposures.

A screening test ~~has been~~ run on the CT's required to cause burns of different degrees of severity on the bare skin of the arm.

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AUTHORIZATION

1. This work was authorized under Project 547/41, "Maintenance, Bureau of Ships," dated 16 December 1940. The problems which were proposed for study were given in Bureau of Ships letter S-177-2 (Dz), Serial 611 of 17 December 1940.

STATEMENT OF PROBLEM

2. This investigation was undertaken to design, calibrate and study the operation of a gas chamber for the exposure of human volunteers to the vapors of chemical warfare agents, and to evaluate Navy Issue Impregnated Protective Clothing and Masks when exposed to H vapor, and test the irritancy of Protective Ointments.

KNOWN FACTS BEARING ON PROBLEM

3. At present the Navy is issuing single layer protective clothing which requires suitable testing against vesicant vapors on human beings. Newer developments in protective devices also require extensive testing before they can be adopted. Therefore, it is essential to test such items as clothing, masks, ointments, etc. under carefully controlled conditions so that proper evaluation can be made of existing protecting measures, and to test newer developments still in the experimental stages.

4. TDMR #731 from CWS, Edgewood Arsenal, Md. describes chamber tests on subjects protected only by impregnated shorts. Complete protection against H vapor was afforded to the scrotal area by the impregnated shorts whereas burns of casualty severity resulted on other areas of the body from exposure to 315 to 600 mg. min./m^3 (CT).

THEORETICAL CONSIDERATIONS

5. The use of a properly constructed gas chamber for testing protective equipment against chemical warfare agent vapors is the best available method which will most closely simulate actual field trials and yet be operated under conditions which can be controlled critically. The whole body or, by suitable use of proper protection, any area of the body can be used for testing. The temperature, humidity, concentration of vesicant vapor and length of exposure can be varied at will in the chamber so that any type of condition can be achieved. Relatively high temperatures and humidities have been used in the tests actually carried out so far since the human skin is more sensitive to H vapor under these conditions. It can be assumed that if protective devices, such as clothing, prove to be adequate in these tests they will also be adequate under more temperate conditions.

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PREVIOUS WORK DONE AT THIS LABORATORY

6. No gas chamber work has been done previously at this Laboratory.

EXPERIMENTAL WORK

I. GAS CHAMBER DESIGN, CALIBRATION AND OPERATION

GENERAL DESCRIPTION

7. The NRL gas chamber consists of a lead-lined room built as an addition to the laboratory building. It is designed as a static chamber, i.e., no air is passed through the chamber during a test, but the air in the chamber is continually circulated and volatilized agent is added as required to maintain the desired concentration. The volume of the chamber is such as to conveniently accommodate a maximum of ten subjects engaged in moderate activity, and construction is according to the following general specifications.

8. Size: Inside dimensions are 10 ft. by 15 ft. and 12 ft. high, giving a volume of 1,800 ft.^{3} or 50 m.^{3}.

9. Construction: The chamber is of transite covered frame construction insulated with rock wool. The floor is concrete and is provided with a center drain. The ceiling and walls are lined with lead, all joints being soldered.

10. Entrance: Entrance to the chamber is made through an antechamber approximately 5 ft. by 3 ft. and 7 ft. high. Doors of both the inner chamber and the antechamber are 2'6" by 6'8", open outward, and are weatherstripped and gas proof.

11. Observation Window: This window, approximately 12" by 18", is located near the entrance to the antechamber. It is a single pane, double window with a dead air space between.

12. Porch: An open porch of frame construction is built on to the gas chamber and the laboratory as an approach to the chamber entrance. The roof contains two skylight windows for lighting, and an exhaust fan, General Electric Spec. 272905-1, is mounted in the roof near the antechamber door for ventilation.

13. Exhaust System: An exhaust blower, Buffalo Limit Load Conoidal Fan, size #2, single width, Type LL, clockwise, with direct connected 1/2 H.P. 220-volt motor, is mounted in a gas proof compartment in one corner of the chamber. This compartment is approximately 42" by 30" and 36" high, with a door to the outside for access to the blower. A 12" diameter sheet metal duct extends through the compartment wall 2" into the chamber. The duct opening is equipped with a removable sheet metal cover.

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TABLE XI (Cont'd)

Summary

Relative Humidity

Average = 67%   Maximum = 71%   Minimum = 63%

CT

Actual CT = (60 x 20.4) = 1224

II. INITIAL TESTS OF NAVY ISSUE PROTECTIVE CLOTHING AGAINST H VAPOR

SUBJECTS

75. There has never been any difficulty in getting volunteers for the experiments despite the fact that only two inducements were offered; i.e., leave and liberty—change of scenery. However, these facts definitely support the assumption that leave and new surroundings are still uppermost on the average sailor's priority list. Financial remunerations, which seem to play an important part in the rewards offered to volunteers in other countries, i.e., England, Canada, Australia, etc., have never been considered by us nor asked for by the men.

76. It has been impressed on the men that they are not "guinea pigs". They are told that they are expected to use their heads as well as their bodies; and if they do not understand anything to ask questions, these questions being answered in a simple and non-technical language.

77. During their stay at this activity, which varies from one to four weeks, the men pick up an amazing amount of gas warfare fundamentals and, if this is supplemented by a moderate amount of instruction, they leave with a basic amount of knowledge of defensive gas warfare which should be sufficient for the duties required of an enlisted man in the Navy Defensive Gas Warfare Program. The fact that has been most obvious throughout these experiments is that when the men first begin the work they should not be told too much. If they are, it sets up a fear reaction that remains for varying lengths of time and definitely affects their "virgin" runs in the chamber, and, occasionally, requires a removal from the chamber before the run is completed. However, after the first two runs in the chamber, the men become veterans and can be told almost anything without affecting their morale.

78. The men take any resulting casualty extremely well. Even the hospital cases, who, on a few occasions, were incapacitated for a month or so, were not upset and even volunteered for further trials.

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79. Occasionally there have been individuals or groups who did not cooperate fully. A short explanatory talk, and, if necessary, a slight verbal "dressing down" has always proven successful. There has not been a single instance in which a man has refused to enter the gas chamber. Our opinion is that the men who have come through this program are much better equipped both mentally and physically to withstand gas warfare if and when it comes.

Dressing down

Physical Examination and Requirements

80. Emphasis must be placed on physical fitness. If not, the experiments are doomed to failure due to inability of the men to remain in the suits and masks and perform effectively when exposed to the high temperature and humidity of the chamber. The so-called false positive readings, due to physical unfitness, such as conjunctivitis, laryngitis, nausea, shock, etc., can easily be mistaken as gas manifestations. Another common symptom, headache, may be attributed to the tight mask straps, etc., when it is actually due to a systemic condition not caused by the chamber. In this connection, it may also be said that it is impossible to give the men liberty during a regular series of experiments and expect them to be in good physical condition the next morning; there always are a few that imbibe too freely and stay ashore too late to be in good condition for the experiments the next day. Because of the above conditions, a thorough physical examination is performed by the Medical Officer, particular attention being paid to the parts of the body most liable to be affected by the gas, i.e., the skin, eyes, genitalia, throat, etc. Many abnormalities are noted and also brought to the man's attention before he enters the chamber. This prevents false interpretations by both the examiner and the men.

Nite Re [illegible]

81. As a supplement to the actual physical examination complete blood counts, urinalysis, and temperatures are taken; the work being done by qualified laboratory technicians. Blood counts are repeated after a cumulative CT of 4800. The history of each man is briefly checked by the Medical Officer, emphasis being placed on asthma, allergy, hay fever, skin diseases, etc. At this time, a quick psychological impression is also obtained.

82. Upper respiratory infections are the most common disabling factors, and if objective symptoms are present, the man is not sent into the gas chamber. Immediate treatment is instituted and it is usually possible to use the man in a later experiment. This procedure also applied to any other minor physical disability.

83. No man is sent into the chamber without the Medical Officer's approval. Occasionally, at this point, malingerers and psychoneurotics are discovered. These cases have all been handled so far by minimizing their symptoms and then sending them into the chamber.

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GENERAL PROCEDURE FOR CHAMBER TESTS

84. Each man exposed in the chamber was equipped with the following:

a) Navy diaphragm masks, Mark III.
b) Impregnated Arnsen protective suits.
c) Standard Navy underwear (unimpregnated).
d) Impregnated cotton socks and impregnated elbow length wool gloves.
e) Overshoes (Arctics).
f) Protective ointment for face and neck.
g) Impregnated undershorts for exposure to CT's above 1000. (Heavy cotton rib-knit underwear cut off at knee and rolled to give gas-tight fit.)

85. The impregnated Arnsen protective suits used in these tests were of three types.

a) Water suspension - Impregnated in a Navy Portable Plant with a water suspension at room temperature using the following formula: 100 S-145/75 CP/25 ZnO/3.75 PVA/0.75 Daxad 11/0.18 Duponol ME/9 Pigment, with enough water added to give a bath containing approximately 10% S-145.

b) Solvent - Impregnated in a Navy M-1 Plant with a solution of S-145 in tetrachloroethane at 55°C.

c) Solvent + ZnO - Impregnated in a Navy M-1 Plant with a solution of S-145 in tetrachloroethane containing 15% ZnO based on the weight of S-145 at 35°C.

86. The physically fit men chosen for a given test were instructed in the use of the gas mask and then checked with masks on in an atmosphere containing a high concentration of a lachrymator (CN). This was done to make sure the masks fitted properly without leakage. The men wore dungarees in this test to avoid subsequent contamination of the chamber atmosphere.

87. The men then dressed in protective clothing under close supervision to insure gas-tight seals at waist, face, ankles and wrists. Unimpregnated underwear was put on first, then impregnated shorts, followed by suit, socks, arctics, ointment, gloves and mask. Protective ointment was applied to the neck and face extending just inside the edge of the mask facepiece. A final inspection was made of masks and clothing just before the men entered the chamber.

88. Before each chamber test, qualified persons were required to sign a log attesting to the satisfactory condition of the following: (a) canisters, (b) active chlorine content of clothing, (c) concentration of agent in the chamber, (d) physical condition of the men, (e) proper adjustment of protective clothing and masks.

89. The men entered the chamber through the antechamber in groups of five. The chamber was operated under conditions considered average for the tropics, namely, 90°F, 68% Relative Humidity (R.H.).

90. Continuous visual and audio communication was maintained between the officer in charge and the men in the chamber. Every five minutes each man was required to move to a position on the opposite side of the chamber, otherwise they were permitted to move about at will. The time of each exposure was one hour, after which the men left the chamber and remained in the open five minutes to aerate their clothing and then removed their masks and gloves. The clothing was worn an additional four hours, outdoors in the shade on warm days and in a room at 75-80°F on cold days. During this time the men were not exercised but were allowed to move about freely.

91. Clothing was removed and the men were examined immediately and at subsequent twenty-four hour intervals, the areas most vulnerable to H vapor being closely checked. The face and neck were examined for evidences of ointment irritation.

EXPERIMENTAL RESULTS

Test No. 1 - Irritancy of Impregnated Arnzen Suits

92. In order to determine the irritancy of the Protective Clothing under severe conditions, ten men with full equipment were subjected to a temperature of 96°F and 81% R.H. in the chamber for one hour. Five of the men wore Arnzen suits impregnated with S-145 by the water suspension process, and the other five men wore Arnzen suits impregnated by the solvent process (without ZnO). S-461 Protective Ointment (15% [illegible] was applied to the neck and face at the edges of the mask before the test. The results are summarised in Table XII. The outside temperature was 90°F and the R.H. was 37%.

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SERIAL NO. 41

Navy Department - Office of Research and Inventions

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AD-396 275L

6/13/83

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DECLASSIFIED: By authority of
DoD DIR 5200.9
Date
Entered by NRL Code

CHEMISTRY DIVISION - PROTECTIVE CHEMISTRY SECTION

14 August, 1945

CHAMBER TESTS WITH HUMAN SUBJECTS
IX. BASIC TESTS WITH H VAPOR

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~~Report P-2570~~ NRL 2579

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Preliminary Pages . . . a - d
Numbered Pages 28
Plates 17
Distribution List . . . e

NRL Problem P-60-3

ABSTRACT

This report describes the results of exposures to H vapor of men wearing ordinary clothing and unprotected except for masks and, in some cases, protective shorts, over a wide range of exposure conditions. Various methods for the evaluation of the results obtained are presented and discussed.

The severity and locations of burns from a given CT of H vapor were markedly influenced by the temperature of exposure. At low temperatures (70° F.) active sweat secretion and H vapor burns were predominantly in the axillary and genital regions. At high temperatures (90° F.), both sweating and H vapor burns were generalized. The threshold temperature for generalized sweating, and consequent increased susceptibility to H vapor, was approximately 85° F. for lightly clothed, resting men. Variation in relative humidity had the most pronounced effect on susceptibility to H vapor at 85° F.

Conditioning of the men before exposure, either artificially or because of climatic conditions, had a significant effect on the reactions produced from exposure to H vapor. Suppression of sweating by application of aluminum chloride to the axillas prior to exposure, reduced the severity of the resulting H burns. The application of lanolin to the skin prior to exposure had no effect on the resulting H burns, whereas wetting of the skin with artificial sweat increased the severity of the burns.

The scrotal region was the most vulnerable area of the body to H vapor and would be the most important area in the production of casualties. It was found that ulcerated and crusted lesions of the penoscrotal region required from three to four weeks to heal with the men at bed rest.

KEY WORDS

Aluminum Chloride, Antiperspiants, Chamber tests, Human subjects
H vapor, Mustard gas, Chemical warfare, Chlothing, Erythema, Exposure,
Humidity, Persistance, Contamination, HN vapor, Impregnated chlothing,
Lanolin, Levenstein H, Nitrogen mustard, Physiological effects,
Toxic agents, Vesicants.

23. Individual variation. A simple test to predict how a given individual will react to H vapor has not been developed. The influence of this variable must still be minimized by using as many men as possible in each test.

E. Previous Work Done at this Laboratory.

24. NRL Report No. P-2208 dated 22 December 1943 contains a description of the design and operation of a chamber for exposing human subjects to known concentrations of H vapor under controlled conditions of temperature and humidity. NRL letters to BuShips, C-S77-2(459-BWC), C-459-604 dated 20 October 1944 and C-S77-2(459-BWC/JEH), C-459-119/45 dated 10 March 1945, include a preliminary report on the effects of CT, temperature, and relative humidity on the reactions of men exposed to H vapor when wearing ordinary clothing. In the present report, all the basic tests with H vapor carried out at this Laboratory to May 1945, are summarized.

EXPERIMENTAL PART

Part I - Procedure.

A. Basic Tests with H Vapor.

25. Basic tests, as defined at this Laboratory, are tests with vesicant vapors carried out on men wearing ordinary clothing and unprotected except for masks and, in some cases, protective shorts.

(1) General Procedure for Basic Tests.

26. Test subjects. The men used in these tests were volunteer Naval personnel from USNTC, Bainbridge, Maryland, and were usually seamen second class, from eighteen to twenty years of age who had just completed their "boot" training. Most of their homes were in the Atlantic Seaboard States, both north and south of Washington, D. C. All men received a routine physical and laboratory examination (blood and urine) and only those approved by a medical officer participated in the experiments. At the end of the tests, the men were granted special leave and an entry was made in their service records attesting their attendance at this activity. Recently, authorization has been granted for the commanding officer to give commendation to especially deserving individuals.

27. Clothing. During chamber exposure, the men wore standard issue skivvy shirts and Nainsook shorts, watch caps, blue denim shirts, dungaree pants, standard socks and shoes. Shirt collars were buttoned and shirt sleeves were buttoned at the wrist. All men wore ND Mark III or IV masks. In some of the tests, the Nainsook shorts were replaced by CO-2 impregnated shorts. These latter were of the rib-knit type, impregnated by the aqueous process, and contained about 0.5 mg. Cl^+/cm^2. In all tests since 1 January 1945, the men have worn suspenders made of carbon coated cloth (August model). The protection afforded by these suspenders causes a subjacent area of relatively normal skin which contrasts with the erythematous areas and facilitates observations (Fig. 36, Plate 10). Subjects dressed for a basic test are illustrated in Fig. 1, Plate I.

28. The chamber. The chamber has been described in detail in NRL Report No. P-[illegible]08. Briefly, it is 10 feet by 15 feet by 12 feet high and has a volume of 1800 ft.^{3}. It is operated as a static chamber, no air being passed through during a test, but the air present is kept in motion (average velocity = 2.0 m.p.h.) by suitable fans.

29. Concentration of agent. Volatilized redistilled thiodiglycol mustard was introduced into the chamber as needed to establish and maintain the desired concentration on the basis of Northrop titrimeter analyses (bromine method) which were made every five minutes. The average concentrations of H vapor in this series of tests varied from 1.67 to 11.7 micrograms H/liter.

30. Time of exposure. All basic tests were single exposure tests. In all cases the time of exposure was 60 (± 2) minutes except the two tests at CT 60 in which the exposure time was thirty minutes.

31. CT. CT represents the product of the concentration of the agent and the time of exposure; and where the units are not expressed, is understood to be in microgram minutes per liter. In this series of tests, the CT employed was varied from 60 to 700. A complete list of these CTs is presented in Table III.

32. Temperature and relative humidity (RH). The chamber temperature was elevated by electric heaters, and was lowered by means of ice. Humidification was accomplished by the introduction of steam; dehumidification, by the use of ice. Both temperature and humidity were regulated and recorded by a two-point Brown recording controlling potentiometer which operated through wet and dry bulb thermocouples. All temperatures given are dry bulb temperatures of the ambient air expressed in degrees Fahrenheit; Measurements of radiant energy effects have not been made.

33. Activity in the chamber. The men stood at ease in the chamber, but were required to change positions about every five minutes. No tests on the effects of exercise during chamber exposure are included in this series.

34. Activity before and after chamber exposure. In general, before and after chamber exposure, the men led a relatively sedentary existence with occasional mild athletics. In none of the tests in this series were the men assigned to strenuous work after chamber exposure.

35. Season and climate. The majority of the tests were performed as listed in Table III (Page 13), when the weather was relatively cool. Tests 2, 4, 8, 13 and 16 were carried out under the hot summer weather conditions of Washington, D. C. The chamber exposures were usually performed between the hours of 1000 and 1500, i.e. during the warmer part of the day. When the weather was fair, the men were allowed to be out of doors before and after chamber tests; when the weather was cold or inclement, the men were kept indoors at the conditions prevailing in the Laboratory.

36. Daily readings and the recording of data. The men were inspected daily by a medical officer for four to eight days or longer after exposure. To facilitate recording and subsequent use of data, subdivisions of the body surface were listed as ordinates on graph paper (one-quarter inch squares) and daily intensity readings for these areas were recorded as abscissae. A list of the body regions is given in Table I (page 10).

37. Photography. Kodachromes were taken of many of the groups of men used in the basic tests. These were usually taken on the fourth day after exposure; subsequent pictures were taken when deemed necessary. More satisfactory pictures were obtained after the skin had started to pigment since mild degrees of erythema did not show enough contrast on the pictures. It must be emphasised that kodachromes alone are not adequate records and that the daily readings are a more reliable reference for following the intensity of reaction. Inadequate illumination may lead to under-exposure of certain skin areas with a resultant apparent erythema which is an artefact. The prints which are included in the appendix were prepared by the Ansco "Printon" process. The larger ones were prepared from 4 x 5 inch transparencies; the smaller, from 35 mm. transparencies.

(2) Special Basic Tests.

38. Effect of environmental temperature immediately prior to chamber exposure. During the summer, the men were necessarily warm and often sweating at the time of entry into the chamber. When the weather was cool or cold, the men were usually indoors at a comfortable room temperature for one to two hours (or more) prior to exposure. Tests 24 and 25 (Table III) were carried out to see if precooling had any effect on the reactions from chamber exposure. Five men were exposed nude to a temperature of 55° to 60° F., approximately 65% RH, for over two hours prior to entering the chamber. Five other men remained clothed and at a comfortable room temperature, approximately 75° F. and 60% RH, for a similar period before exposure. Both groups donned fresh clothing, including CC-2 impregnated shorts, and were exposed in the chamber simultaneously to H vapor at CT 300, 90° F., 65% RH.

39. Use of aluminum chloride. To suppress axillary sweating, in Test 28 (Table III), a 25% aqueous solution of aluminum chloride was applied with a cotton pledget once daily to the left axilla of each man in the group for three successive days before he entered the chamber.

40. Use of lanolin. Since H is lipoid soluble, it was considered possible that the presence of sebum on the surface of the skin might influence the susceptibility of the skin to H vapor. To simulate sebum, lanolin (hydrated approximately 50%) was used. A thin film was applied shortly before entry to the chamber over an area of about thirty square centimeters on the forearm, posterior neck, and posterior shoulder of the men in Test 28, who were exposed to CT 500, 70° F., 48% RH. In a later test (Test 24), in which the men were exposed to CT 300, 90° F., 65% RH, lanolin was applied to the forearm, posterior shoulder, posterior neck, and left axilla. No men took showers for at least four hours after exposure in the tests in which lanolin was used.

41. Artificial wetting of the skin. On the basis of Dr. Renshaw's informal report on the effects of H vapor on simulated wet, sweating skin, the following experiment was performed. Standard skivvy shirts were treated with paraffin wax so that a waxed strip about two inches wide extended vertically the length of the shirt in the midline front and rear.

One-half of the shirt was thoroughly moistened with artificial sweat,* the other half was left dry. These shirts were then donned by six men who also wore denim shirts and the usual clothing for basic tests (including CC-2 impregnated shorts). The environmental temperature was sufficiently low so that the men did not show generalized sweating prior to entry into the chamber. These non-sweating men were exposed to H vapor at CT 300, 70° F., 45% RH on 2 April 1945.

(3) Evaluation of Data.

42. Since it is impractical to present a detailed description of each subject in every test, an attempt has been made to present the data quantitatively so that the results may be more readily visualized. Each degree of reaction was given an arbitrary numerical value as follows:

0 = no reaction
1 = mild erythema
2 = moderate erythema
3 = intense erythema
4 = a. Erythema with edema
    b. Maceration of axillary skin
    c. Dry scaling of scrotum
5 = a. Vesicle
    b. Numerous pinpoint vesicles
    c. Crusting or ulceration of scrotum or axilla.

43. From these numerical values, three quantitative methods of treating data were devised which are considered in this report; (1) Maximum severity; (2) Total damage index; and (3) Percentage of exposed area affected. Special cases, such as lesions of the scrotum, are discussed separately.

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FOOTNOTE;

* The synthetic sweat solution was prepared according to a formula supplied by Dr. Dana Burks and is approximately five times as concentrated as that secreted by the glands.

Constituent	Concentration gms. or cc./100 cc.
Sodium chloride	3.65
Ammonium acetate	0.33
Urea	0.47
Dextrose	0.065
Potassium chloride	0.48
Magnesium chloride	0.036
Potassium dihydrogen phosphate	0.045
Calcium carbonate	0.065
Lactic acid (85%)	0.1

Five drops each of formic acid, acetic acid, butyric acid, propionic acid, methylamine and trimethylamine.

44. Maximum severity. This method has been used at this Laboratory and has been described in previous letter reports (ERL letter C-577-2(459-BTC) C-459-604 dated 20 October 1944). The average maximum severity recorded over a period of several days after exposure, regardless of the region of the body affected, was taken to represent the effect of the agent on the body under a given set of conditions. A satisfactory relationship between CT and intensity of reaction could be demonstrated using this method as long as all tests were conducted at 90° F., 65% RH. However, when the temperature and RH were varied, it was found that the maximum severity method was no longer applicable since men with an obvious difference in reaction to the agent might, nevertheless, have the same maximum reading. For example, one man might have as a maximum reading an intense erythema of the axillae with essentially no burns elsewhere and another man might have an intense erythema over most of his body. By the maximum severity method of evaluation, both men would be classified as the same. Figure 4, Plate 3 gives an illustration of this since the men who do not show generalised erythema did have intense erythema of the axillae.

45. Total damage index. Since it was observed that often men exposed to H vapor at various conditions of temperature and RH differed in their reactions mainly in the areas of skin affected rather than in the intensities of reaction, and since it is common knowledge that the total area of skin affected is a highly important factor in determining systemic reactions to thermal burns, it was felt desirable to obtain an approximation of the percentage represented by a given body region of the total area exposed in a test. In order to facilitate use of older data, the areas were combined in the manner shown in Table I. These areas were then marked off with ink in arbitrary fashion on ten men of various weights and statures. The regions were measured and their areas were calculated according to the simplest geometric form represented. Their sums represent the total area considered in the basic tests, and each region has been represented as a percentage of this sum. These percentages are called "area factors" and are listed in Table I. It is of interest that for any given man, this sum represents 73 + 6% of his theoretical total body area as obtained from standard height-weight nomograms. Although these area factors represent only a crude approximation and are highly arbitrary, it is felt that they are useful in evaluating the data obtained from the basic tests.

46. In calculating the total damage index, the intensity scale mentioned in paragraph 42 was used. The intensity factor for a given area in a test represented the average maximum reading for that area for that group of men. The product of the intensity factor and the area factor described above gives the total damage for that area for the group under consideration. The sum of these products for the eighteen areas considered represents the total damage index. An example of the method employed is given in Appendix B. In order to compare data on men who wore protective shorts with data on those who did not, it was necessary to subtract from the final index the figures for those areas on the unprotected men which would have been covered had shorts been worn.

[redacted]

Hold for Release Until
Presented by Witness

National Aeronautics and
Space Administration

February 2, 1994

Subcommittee on Administrative Law and Governmental Relations

Committee on the Judiciary

U.S. House of Representatives

Statement by:
Dr. Harry C. Holloway

103rd Congress

Statement of

Harry C. Holloway, M.D.
Associate Administrator for
Life and Microgravity Sciences and Applications
National Aeronautics and Space Administration

before the
Subcommittee on Administrative Law
and Governmental Relations
Committee on the Judiciary
U.S. House of Representatives

Mr. Chairman and Members of the Subcommittee:

I am pleased to have this opportunity to report on NASA's continuing investigation into any Agency role in Government-sponsored radiation tests on humans.

NASA is cooperating fully with the Human Radiation Interagency Working Group established by President Clinton. We are currently engaged in a rigorous program of records review and are conducting interviews with present and former employees and contractors to search out and report all cases in which NASA may have sponsored or conducted experiments that included deliberate exposure of humans to ionizing radiation.

In order to assure the completeness and rigor of this examination, NASA Administrator Daniel Goldin has established a central command-like structure. Administrator Goldin has charged me to assume full responsibility for the conduct of this investigation. I have named Dr. Earl Ferguson, Director of the Aerospace Medicine and Occupational Health Division, to coordinate this Agency-wide search at Headquarters. Dr. Donald Robbins, Acting Director of Space and Life Sciences at NASA's Johnson Space Center, has been appointed to lead a team to conduct a thorough search for, and review of, NASA records concerning any and all radiation research. This information will be provided to the Interagency Working Group as a component of the Administration's Government-wide investigation.

Furthermore, in order to assure that this investigation is conducted in accordance with the highest standards of excellence and rigor, I have asked that an Internal Oversight Committee be established within NASA to review the conduct, policies, and findings of this investigation.

Administrator Goldin has contacted all field installations and issued directives requiring full cooperation from all NASA employees to locate all records relating to human radiation experiments in the custody of the Agency and its contractors. We have explicitly ordered that no records relevant to this investigation be destroyed, and that all be reported to Dr. Robbins.

Dr. Robbins' team is conducting interviews with current and former NASA employees who have either been responsible for research areas that may have sponsored radiation research or who have occupied management positions through which they could have learned of such research. Members of the Robbins team have spoken with current and former program managers and scientists at NASA Headquarters, Johnson Space Center, Ames Research Center, Kennedy Space Center, Langley Research Center, and Lewis Research Center. A review of all scientific literature is also underway to establish any leads concerning NASA-conducted radiation research.

We are investigating the procedures and techniques used by NASA in its human research both before and since 1974. We will document where possible the nature of the consent obtained and make both our findings and all documents that pertain to human radiation research available for review by the President's Advisory Committee on Human Radiation Experiments.

It should be stressed that all human research conducted by and for NASA in which subjects are intentionally exposed to ionizing radiation — even in the minute amounts generated from radioisotopes used in routine clinical tests — is reviewed and approved by a human research policy and procedures committee or a similar institutional review board, following review and approval by a radiation safety board. In addition, radiation exposure analyses of each subject are performed and reviewed by these committees to assure that cumulative radiation exposures from all known causes do not exceed established limits. NASA's goal has always been to keep the radiation risk to the lowest possible levels commensurate with an active and safety-conscious program involving human space fight.

Before I discuss the details of NASA's investigation to date, I would like to underscore the importance of the biological experimentation and research NASA performs. A strong program of biological experimentation, including research involving human subjects, is vital to the success of America's space program. A cardinal feature of NASA's Life Sciences Program is the conduct of well-designed, peer-reviewed, quality research involving voluntary human subjects participating in scientific studies that have been appropriately reviewed by an institutional review board. NASA is committed to being proactive in assuring that any human research study funded or otherwise supported by NASA adheres rigorously to the highest ethical and scientific standards. NASA has espoused and is committed to following 45 CFR Part 46, the Department of Health and Human Services regulation "Protection of Human Subjects."

NASA has a long-standing interest in the biological effects of sustained doses of ionizing radiation on humans because the environment of space contains increased levels of naturally-occurring ionizing radiation. The earth's atmosphere and magnetic field protect life on the surface from a large fraction of this potentially harmful radiation. However, as astronauts ascend above the atmosphere to low-earth orbits, and above the earth's sheltering magnetic field for voyages to the moon and beyond, they leave behind the natural shields that protect terrestrial life. NASA's primary interest in the effects of ionizing radiation derives from the need to protect astronauts from increased galactic radiation and risks of more intense natural radiation events associated with solar flares.

NASA's interest in activities involving exposure of humans to ionizing radiation can be divided into three categories:

1. Exposure of astronauts to ionizing radiation during spaceflight;

2. Clinical medical uses of radioisotopes, X-rays (ionizing radiation), and advanced diagnostic techniques to monitor the health of astronauts and to define the medical and physiological effects of reduced gravity on human subjects; and,

3. Analysis of dose-response data generated from studies of humans exposed to ionizing radiation either by accident or as part of other, unrelated medical studies.

Astronaut Exposure:

NASA's Johnson Space Center at Houston maintains extensive records on cumulative exposure of astronauts to radiation, including space radiation during spaceflight, medical X-rays, and radioisotopes injected for medical studies. The average mean career exposure of an astronaut to space radiation, X-rays, and radioisotopes is approximately 8 millisieverts (mSv), 20 mSv and 4 mSv, respectively. These levels of radiation are small and have no measurable clinical effects. When compared with the general population, the projected radiation-induced cancer mortality risk to the entire cohort of astronauts from all three sources is less than 0.1 percent. Individual astronaut career exposure limits are established to keep the increase in risk level at less than 3 percent above the risk in the general population. The astronauts have all been informed of that additional risk.

Guidelines for the current astronaut exposure limits were recommended to NASA by the National Council on Radiation Protection and Measurements (NCRP), in its Guidance on Radiation Received in Space Activities (1989). In accordance with the January 20, 1987 Presidential Memorandum (52 FR 2822, 1/27/87) approving "Radiation Protection Guidance to Federal Agencies for Occupational Exposure," astronauts are classified as "radiation workers" because they must work in a radiation environment which introduces an occupational hazard. In cases where gains from an activity outweigh risks, federal agencies may adopt supplementary standards to the Occupational Safety and Health Act (OSHA) standards for ionizing radiation (29 CFR 1910.96). In a letter dated December 14, 1989, the NASA Administrator notified the Department of Labor that supplementary standards had been adopted for astronaut exposures to space radiation. By letter dated March 1, 1990, the Secretary of the Department of Labor found the standards acceptable in accordance with 29 CFR 1960.18. NASA complies with all of the principles covered in the memorandum, including the principle of minimizing exposure to "as low as reasonably achievable" levels (ALARA).

Clinical and Medical Uses of Radioisotopes:

Almost since the inception of the space program, NASA scientists have conducted research to determine the adverse effects of reduced gravity on human physiology. In conducting this research, state-of-the-art clinical diagnostic and research tests have been used, including tests that employ radioisotopes to define the effects of reduced gravity on the lung, heart and blood vessels, the balance organ (the inner ear), bone, blood, muscles, and the immune system.

Such tests have been used in ground-based simulations, preflight and postflight investigations, and all of our flight programs since the Gemini program. In each instance, volunteers were used. These volunteers were made aware of the risks, and gave their informed consent for the tests.

Radioisotopes have been used to detect changes induced by spaceflight in body fluid distribution, red blood cell mass, and red blood cell formation. In addition, diagnostic techniques using low-doses of ionizing radiation have been used to measure changes in the skeletal system.

Analysis of Dose-Response Data:

Astronauts on the Space Shuttle and the future International Space Station are protected from high levels of radiation in low-earth orbit by earth's magnetic field. Although United States astronauts have never been exposed to extremely high levels of radiation during spaceflight, they could be exposed to unexpectedly high radiation levels from solar flare particle events if they venture outside the earth's magnetic field. For this reason, NASA has had a legitimate interest in the dose-response relationships between high levels of radiation exposure and the early clinical symptoms of such exposure -- loss of appetite, nausea, vomiting, diarrhea, and fatigue, etc. Such symptoms could interfere with the ability of astronauts to perform the tasks necessary for their safe return to earth. The Space Sciences Board of the National Academy of Sciences convened space radiation study panels in 1961 and 1964 and published a report, Radiobiological Factors In Manned Spaceflight, which recognized the need for more data on "radiation dose-response relationships" and recommended that NASA take advantage of "every ethical means to obtain more information collected under conditions that permit better risk evaluations..." The report further stated that "wherever possible, opportunities to improve the quality of human data should be sought out and encouraged."

NASA-Sponsored Research and the Atomic Energy Commission:

In December 1963, the Atomic Energy Commission (AEC) proposed to NASA that a research project entitled, "Retrospective Study of Radiation Effects" be conducted at Oak Ridge. This was a study by investigators at Oak Ridge designed to examine past medical records of individuals who had been previously exposed to radiation, either by accident or as medical therapy for cancer or other illnesses. In addition, in the late 1950s, investigators at Oak Ridge began studies of the potential of ionizing radiation for the treatment of certain types of cancer. In 1964, NASA entered into an agreement with the Division of Biology and Medicine of the AEC to acquire data from both the retrospective study and a prospective study of the clinical effects of the radiation. To support the prospective study, NASA transferred $65,000 to the AEC for patient monitoring equipment and $2 million to be expended over a 10 year period for personnel costs. NASA's support represented less than one-tenth of the total cost of the AEC study, the estimated cost of which was $26 million over 10 years. As far as we have been able to determine, this is the only study that NASA has funded or partially funded to determine prospectively the clinical effects of intentional exposure of humans to ionizing radiation. It should be emphasized that NASA had absolutely no role in the design of the study, selection of patients, or the clinical management and treatment of any patient in this study. NASA's interest was solely in obtaining the clinical data of patients who were being exposed to radiation for other reasons.

The prospective study conducted at Oak Ridge was reviewed by the Subcommittee on Investigations and Oversight of the House Committee on Science, Space and Technology, on September 23, 1981. The NASA witness, Mr. Andrew J. Stofan, Acting Associate Administrator for Space Sciences, gave the subcommittee a succinct description of the relationship between NASA and Oak Ridge. According to available records, NASA Headquarters grant no. R-0104-09 with the Atomic Energy Commission covered the period 1964-1974. The studies were completed in 1968 and the data analyzed before the project was administratively completed and closed out on May 5, 1974. As Mr. Stofan testified, NASA's records of the study were retired, transferred to the Federal Records Center, and subsequently destroyed in accordance with prescribed practice.

In summary, Mr. Chairman, NASA's relationship with the Atomic Energy Commission was strictly for obtaining data on previous human exposure to radiation and from a prospective study that was otherwise being conducted by the AEC. A careful search of available records, publications, and inquiries of knowledgeable NASA scientists (active and retired) has thus far revealed no other NASA-affiliated human research involving dose-response to ionizing radiation. However, we take this matter very seriously and continue to make every effort to identify documents related to human radiation experiments. Any and all documents so identified will be preserved and made available to the President's Advisory Committee on Human Radiation Experiments and to other appropriate fora. We will make full disclosure of our involvement in any such experiments.

The Statement of

The Honorable David Mann

February 2, 1994

"Government Sponsored Human Radiation Tests"

Mr. Chairman, I would like to thank you for convening this hearing today and I would like to thank the witnesses who will testify for their willingness to be here and for the insight they will share.

As you know, Mr. Chairman, I have a very direct interest in the radiation tests that were conducted and funded by the government during the Cold War - particularly those tests conducted at Cincinnati General Hospital between 1960 and 1971.

Since this story first surfaced during the Congressional recess I have been working with the help of University of Cincinnati officials to piece together all of the available information on the nature of the Cincinnati experiments.

So far I have learned that as many as 80 individuals were exposed to doses of partial or whole body radiation. I have also learned that while most or all of the test victims volunteered and consented to the radiation treatments - none were told that the experiments were being funded in part by the Department of Defense. It remains unclear how much they were told about the potential, serious side effects.

Yesterday's Cincinnati Post quotes from a Pentagon document that "In the University of Cincinnati tests... the distinction between saving lives and damaging them may have been blurred." This is very troubling to me.

I know that our job here today - and as members of the Judiciary Committee - is to discuss compensation to victims and their families. But I think we must also stress the importance of full disclosure of all material held by private institutions and by the federal government. The victims of the radiation experiments - whether in Cincinnati or in other parts of this country - deserve a complete explanation of the purpose and nature of the tests in which they participated. Many participants agreed to the tests in the name of "patriotic duty". Others agreed to participate with the hope that these radical methods could in some way extend their lives. Whatever the reason, the government bears the full responsibility for the experiments it funded and must now make a full accounting.

I would like to commend the efforts of Representative Ed Markey who has tirelessly investigated the issue of radiation experiments on behalf of the test victims from his district in Massachusetts. I appreciate his willingness to present to this Subcommittee his recommendations for compensating victims.

I would also like to add that I am encouraged by the attention paid to this issue by President Clinton and his Administration. I commend the establishment of the Human Radiation Interagency Working Group. I hope that this rapid response will enable the relevant agencies to collect all of the radiation documents and that full public disclosure will not be delayed.

Mr. Chairman, as a former United States Naval Officer I can appreciate the desire of the Pentagon to have an accurate assessment of the effects of potential military weapons on our troops. I do not, however, believe that the government should test its wares on private American citizens or military personnel without their complete and educated consent.

As we look into the radiation experiments I will hold the view that federal compensation should be made to the victims when they were not fully informed under the then prevailing standards or when the radiation procedures differed significantly from appropriate medical care devoted only to the interest of the patient and bone fide medical science. I look forward to working with you to craft a compensation bill that will be fair and just. Thank you Mr. Chairman.

MAR 1 - 1994

U.S. Department of Justice

Civil Division

Office of the Assistant Attorney General

Washington, D.C. 20530

February 24, 1994

Honorable John Bryant
Chairman
Subcommittee on Administrative Law
and Governmental Relations
Committee on the Judiciary
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for the opportunity to testify before your Subcommittee at the hearing on February 2, 1994, regarding human radiation experiments and other experimentation on humans. During that hearing, Congressman Gekas requested additional information describing the process for declassifying previously classified documents in connection with the Administration's initiative to retrieve documents relating to human radiation experiments.

While the Department of Justice is unaware of any human radiation experiments conducted or sponsored by any of its components, a search is being conducted to determine whether we have records of such experiments. Accordingly, in response to your inquiry concerning the measures applicable to protection of national security information that might be contained in any such records, we submit the following description of the Department of Justice's procedures for declassifying records.

The Department of Justice regulation for the protection of information relating to the national security appears at 28 C.F.R. Part 17. The regulation prescribes a progressive system for classification, downgrading and declassification; information safeguarding policies and procedures; a monitoring system to insure the effectiveness of the National Security Information Program throughout the Department; and a system for reporting and investigating security violations and sanctions for such violations.

In general, the regulation spells out the different classification levels applicable to relevant national security information, provides for designation of authorized classification officials, and sets forth the procedures for initial classification, subsequent reviews and changes in classification, as well as procedures for storage, access, and accountability for classified information.

Subpart B of the regulation provides the basis for classification and sets forth the policy considerations on establishing and continuing classified status. Section 17.16 sets forth the classification categories -- subject areas that are candidates for classification determinations. Included in these categories are, 17.16 (b)(1) "Military plans, weapons, or operations"; (b)(6), "Scientific, technological...matters relating to the national security;" (b)(7) "U.S. Government programs for safeguarding nuclear materials or facilities;" and (b)(10) "Other categories of information which are related to national security and which require protection against unauthorized disclosure...." A determination to classify may only be made if the information contains one or more of the categories listed and if the unauthorized disclosure of the information reasonably could be expected to cause damage to the national security.

Subpart C of the regulation addresses declassification and downgrading. The general policy provides that information shall be declassified or downgraded as soon as national security considerations permit. Authority for declassification rests with the official who authorized the original classification, the originator's successor, a supervisory official of either, or officials delegated such authority in writing by the Attorney General or the Assistant Attorney General for Administration. In practice, the Department of Justice classification activities are subject to central oversight and guidance by the Department's Security and Emergency Planning Staff.

The Department's current search among its components for records of human radiation experiments will be governed by the above-referenced regulation. If a component of the Department of Justice were to find any classified documents that met the definition of a record of human radiation experiments, the procedure for declassification determination would be that the document[s] would be given to the official who made the initial classification determination (or the official's successor). The decision whether to declassify would be based upon that official's determination whether the information currently meets the standard for continued classification in order to protect against damage to the national security. If the Department were to locate classified records of another agency, such records would be referred back to the classifying agency for a determination whether the documents should be declassified or downgraded.

The Department's process for declassifying previously classified information is in conformity with Executive Order 12356 and is adequate to ensure that such decisions are made in conformity with applicable law and policy considerations relative to the national security.

I hope this information is helpful to the Subcommittee. Please do not hesitate to contact me if you need additional information about this or any other matter regarding the Administration's response to human radiation experiments.

Respectfully yours,

Frank W. Hunger
Assistant Attorney General

Subject: DECLASSIFICATION AND DOWNGRADING

3-00-00 Purpose
05 Declassification and Downgrading authority
10 Mandatory Review for Declassification

3-00-00 PURPOSE

The purpose of this chapter is to provide guidance relating to the declassification and downgrading of information which was originated by other agencies and predecessor DHHS agencies who had original classification authority under prior Executive Orders.

3-00-05 DECLASSIFICATION AND DOWNGRADING AUTHORITY

A. Classified information originated by other agencies shall only be declassified and downgraded by the official of the originating agency who authorized the original classification, if that official is still serving in the same position; by a successor; or by a supervisory official of either.

B. All classified documents originated by a DHHS predecessor agency and being retained for some official reason, may be declassified by the Director, SDD, following the coordination with the IOS, OPDIV, or STAFFDIV that has subject matter interest in the documents. If it is determined that some information meets the current criteria of Section 2-00-10, or there is some doubt concerning its classification, the information must be promptly transmitted in the manner required by Chapter 8-00, to the Director, SDD, for review and transmittal to an agency that has appropriate subject matter interest and original classification authority. That agency shall decide whether to declassify, upgrade, downgrade, or to extend the initial classification level of the document.

C. PSRs of each organization should require the annual review of all classified documents in their possession and control to identify documents which require declassification, downgrading, or destruction. This review should be accomplished prior to completion of the DHHS Annual Status Report on Classified National Security Information.

The following review guidelines shall be followed:

1. All old and obsolete classified documents which have served their purpose must be destroyed in the manner prescribed by Chapter 9-00.

2. All classified documents originated by another agency, as most are, and being retained for some official reason, should be reviewed for declassification and downgrading in accordance with the specific instructions contained on the cover or first page of the documents. If there are no specific instructions, the originator of the documents should be requested to provide the necessary information.

3-00-10 MANDATORY REVIEW FOR DECLASSIFICATION

A. Classified information originally classified by the DHHS predecessor agencies, under prior E.O.s, must be reviewed for declassification upon receipt of a written request by a U.S. citizen or permanent resident alien, a Federal agency, or a state or local government. For release of the information, a valid request need not identify the requested information by date or title, but must be of sufficient particularity to allow HHS employees to locate the information sought with a reasonable amount of effort. Requests should be submitted to the Director, SDD.

B. The Director, SDD, will coordinate the request with the office in charge of Freedom of Information (FOI)/Privacy Act(PA) requests, Office of the Assistant Secretary for Public Affairs, in an attempt to locate the requested classified information. Responses to requests shall be governed by the amount of search and review time required to process the request. However, in the interest of being responsive to such requests, the IOS, STAFFDIV or OPDIV office which has primary interest in the subject matter must be contacted in an attempt to locate and review the requested information. Results of the review, including recommendations and a copy of the requested information, or a request for additional time, must be furnished to the Director, SDD. E.O. 12356 requires that agencies make a final declassification determination within one year from the date of receipt except in unusual circumstances.

C. The IOS, STAFFDIV, or OPDIV office should make a prompt recommendation to the Director, SDD, for the requested information or portions to be declassified. When the requested information cannot be declassified in its entirety, reasonable efforts shall be made to release those declassified portions that constitute a coherent segment. If the information may not be released in whole or in part, the action office must provide the reasons for denial. When the classification of the requested information is a derivative decision based on classified source material of another agency, the information must be provided to that agency for review and comment.

D. Upon receipt of the declassification review recommendation, the Director, SDD, must make the declassification determination after contacting the originating agency, when necessary, and furnish any declassified information to the office handling FOI/PA requests for a determination regarding release of the information.

E. Declassification of all or any information must be accomplished by the Director, SDD, by marking it to reflect the change as well as the authority for, and date of, the declassification action. If the request for declassification is denied, in whole or in part, the Director, SDD, must notify the requestor of the information of the right to appeal the determination within 60 days of receipt of the denial.

F. A requestor may appeal to the ASPER when the requested information is not declassified and released in whole. Appeal review procedures are as follows:

1. The ASPER shall normally make a determination within 30 work days following the receipt of an appeal. If additional time is required to make a determination, the ASPER shall notify the requestor of the additional time needed and provide the requestor with the reason for the extension. If continued classification of the information is required, the ASPER shall notify the requestor in writing of the final determination and of the reason for any denial.

2. During the appeal review, the ASPER may overrule any previous determination in whole or in part when, in his/her judgment, continued protection of information is no longer required in the interest of the national security. If the ASPER determines that the information no longer requires classification it shall be declassified and, unless it is otherwise exempt from disclosure under the FOIA/PA, released to the requestor. The ASPER shall advise the original DHHS reviewing office of his/her decision.

RULES GOVERNING CLASSIFICATION/DECLASSIFICATION OF DOCUMENTS IN THE DEPARTMENT OF HEALTH AND HUMAN SERVICES

Classification -- General

Classification of documents for purposes of national security, and declassification of such documents, are currently governed by Executive Order No. 12,356, 3 C.F.R. 166 (1983), reprinted in 50 U.S.C. § 401 note.

Declassification

Authority to declassify documents is lodged in the agency that originally classified the documents (and normally, the specific official who originally classified the documents, or his/her successor). Exec. Order No. 12,356, § 3.1(b), supra. If an agency had classification authority under a predecessor to Executive Order No. 12,356, it has such declassification authority even if it no longer has classification authority under this order. Id. § 3.1(d). The Department of Health and Human Services ("HHS") does not currently have classification authority, but its predecessor agency, the Department of Health, Education, and Welfare ("HEW"), did until December 1, 1978.

Within HHS, declassification is handled by the Director, Security and Drug Program Division, Office of the Assistant Secretary for Personnel Administration. If the document was classified by HEW, that official has the actual declassification authority because, in almost all cases, the actual classification was effected by predecessor officials in the former HEW. In making the decision whether to declassify, the official consults with program personnel who know about the subject matter of the documents. If the document was classified by an agency other than HHS (or its predecessors), the official coordinates the process of referring the document to the other agency for a decision on declassification. All of the procedures are set forth in the Department's National Security Information Manual, Ch. 3-00.

HHS believes it unlikely that there will be classified material among the records at the Federal Records Center ("FRC") because normally, the National Archives and Records Administration takes custody of classified documents rather than allow the agency to retire them to the FRC.

Classification authority

Executive Order No. 12,356 limits classification authority to the President, agency heads and officials designated by the President in the *Federal Register*, and officials delegated the authority pursuant to procedures set forth in the Order. There have been two such designations published in the *Federal Register*; neither has designated the Secretary of HHS or any HHS official. *See* Order, 55 Fed. Reg. 19235 (1990); 47 Fed. Reg. 20105 (1982). (Both orders are reprinted in 50 U.S.C. § 401 note.) Thus, there are no HHS officials who currently have classification authority.

The Secretary of HEW had classification authority until December 1, 1978. The following is a capsule history of this authority:

1. From at least September 24, 1951, the Department of HEW had authority to classify documents. *See* Executive Order No. 10290, 3 C.F.R. 789 (1949-1953 Comp.). This gave all agencies authority to classify documents. *See id.* § 24.

2. From December 15, 1953, classification authority within HEW was limited to the Secretary. *See* Executive Order No. 10501, 3 C.F.R. 979 (1949-1953 Comp.). This was issued November 5, 1953, and took effect December 15, 1953. *Id.* § 20. For agencies with "partial but not primary responsibility for matters pertaining to national defense," this order limited classification authority to the head of the agency, with no authority to delegate. *Id.* § 2. The President designated the Department of HEW as one of these "partial but not primary" agencies. Memorandum of November 5, 1953, 24 Fed. Reg. 3777, 3779 (1959). This designation was formalized in an Executive Order that amended No. 10501. *See* Exec. Order No. 10901, 3 C.F.R. 432 (1959-1963 Comp.).

3. From June 1, 1972, classification authority within HEW could extend to subordinate officials designated in writing, although HEW could classify documents only at the "Confidential" or "Secret" levels, and not at the "Top Secret" level. *See* Executive Order No. 11652, §§ 2(B)(3), 2(C), 15, 3 C.F.R. 678 (1971-1975 Comp.)

4. From December 1, 1978, HEW and its successor, HHS, have not had classification authority. *See* Exec. Order No. 12065, §§ 1-101, 1-201 to 1-203, 6-204, 3 C.F.R. ____ (1979), *reprinted in* 1978 U.S.C.C.A.N. 9712.

February 27, 1994